

FLIGHT

The
AIRCRAFT ENGINEER
AND AIRSHIPS

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EDITORIAL COMMENT



THE time has come, it would appear, to take stock of the situation which has arisen in connection with the all-metal construction of certain classes of aircraft. To appreciate the present position it is necessary to go back a few years and trace the reasons which led to the general adoption of all-metal

construction.

The all-metal "movement" may be said to have been instituted, as far as Great Britain is concerned, by the Air Ministry, or more specifically by the Air Council. It was realised that with aviation gradually attaining far greater importance than it had in the Great War of 1914-18, the question of suitable timber was likely to prove vital. Already during the last war, when the air arms of the nations involved were insignificant compared with the magnitude which they would assume in any future "unpleasantness," supplies of silver spruce were difficult to obtain. Of that wood there was plenty, in a way, but as the years went by it was found that aircraft manufacturers had to buy larger and larger quantities for each given unit of sound wood. In other words, the percentage of scrap increased by leaps and bounds. The Air Council foresaw that such a state of affairs in any future emergency would be intolerable, and it was decided to inform the aircraft industry that a gradual transition to all-metal construction would be demanded, and that after a certain period—two years, if we are not mistaken—no more aircraft of composite construction would be accepted. This ruling applied to Service aircraft only.

How the British aircraft industry adapted itself to the new conditions is now well known, and the transition was not without its difficulties. However, these were overcome, and by the system adopted by the Air Ministry each of the aircraft designing and constructing firms was allowed to develop its own form of metal construction. The result has been that Great Britain now has available a large variety of structural styles, all thoroughly well tried out in actual service, so that it has been possible to

DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1932
May 20-31. National Aviation Day Displays. See p. 456.
May 21. "Morning Post" Cross-Country Air Race, Heston.
May 21-23. Scottish Flying Club Display, Moorpark, Renfrew.
May 22-30. Conference of Transoceanic Aviators at Rom.
May 25. Opening of Royal Tournament, Olympia.
May 26. "New Methods of Research in Aeronautics," Wilbur Wright Memorial Lecture, by H. E. Wimperis, before R.Ae.S.
May 28. London-Newcastle Air Race for "Newcastle Evening World" Trophy.
May 27-28. G.A.P.A.N. Civil Air Display, Brooklands.
May 31. R.A.F. (Middle East) Dinner at R.A.F. Club.
June 4. Henly's Rally and Gymkhana, Heston.
June 4. Bristol Airport Summer Flying Meeting.
June 4. Leicester Ae.C. Flying Display and Motor Gymkhana at Ratcliffe Aerodrome.
June 7. Junior Ae.C. Dinner at Ham Bone Club, W.
June 11. Close of Royal Tournament, Olympia.
June 12. Herts and Essex Ae.C. Meeting at Broxbourne.
June 12. Ae.C. of Germany Air Pageant at Tempelhof.
June 17-18. Night Flying Display at Ratcliffe Aerodrome.
June 18. Hull Air Display.
June 18. Reading Ae.C. At Home, Woodley Aerodrome.
June 21. Aero Golfing Society: "Flight" Challenge Cup. Bramshott G.C.
June 21-28. Blackpool Air Pageant, Stanley Park.
June 25. R.A.F. Display, Hendon.
June 25-26. International Tourist Rally, Boulogne.
July 8-9. King's Cup Air Race, start and finish Brooklands.
Aug. 19-21. Fourth Annual Canadian Air Pageant, St. Hubert, Que.
Nov. 18-Dec. 4. Paris Aero Show.

compare one with the other and to discover the good and bad points of all. This was undoubtedly a very wise policy, even if subsequent events have proved that there is not a very great deal to choose between at any rate several of the types of construction. Duralumin and steel are the two materials most extensively used, and it may be admitted that but for the Air Council's policy we should not have had many of the new steels which are now available. In many ways, therefore, the transition to all-metal construction has been very beneficial.

There are certain directions, however, in which the universal adoption of metal construction has not been altogether to the good. The all-metal idea has by now so penetrated the general conception of aircraft construction that it is no exaggeration to say that a wooden aircraft is looked upon with a good deal of pity and contempt. Yet if one asks one of the worshippers of the all-metal fetish why he is such a staunch believer in metal, more often than not he cannot give any very convincing reply. The fact of the matter is that all-metal construction has become a "fashion," just as the cantilever monoplane is becoming a fashion. The original reason has been forgotten, but the idea persists.

Where military aircraft are concerned, we are not advocating a return to wood or "mixed" construction. The reasons which led to the adoption of all-metal construction were weighty and well considered. The change-over has been effected, and a reversal would be a retrograde step which no one would wish to see. But the effects on civil aircraft have been somewhat unfavourable, particularly in the light aeroplane class. All-metal construction having become universal in Service types, the idea has gained ground that it must be "better" for small aeroplanes also. The fact that the change-over was dictated by reasons of supply rather than by technical (or structural) considerations has been lost sight of.

There is no difficulty in obtaining sufficient supplies of timber of the right grade for all our peace-time needs. The original reason for going over to metal is, therefore, not operative where private aircraft are concerned. From a structural point of view there is much to be said for the old "stick and string" type of construction. In every instance which has come to our notice, the metallised version of a wooden aeroplane has proved heavier and more expensive than its prototype. What this has meant is not always easy to assess. But we have before us one concrete example in which the "retrograde" step of reverting to wood has made possible a machine which would otherwise have been impossible of achievement. We refer to the De Havilland "Fox Moth." That machine has a ratio of gross weight to tare weight of 1.9, or, in other words, it carries nearly the equivalent of its own weight as disposable load. It is able to carry pilot and three passengers with an inverted "Gipsy III" engine of 120 h.p. only, the power expenditure being the remarkably low figure of 30 h.p. for each occupant. In other words, by reverting to the old-fashioned wood construction it has been possible to

produce an aircraft which marks a real step forward in economical flying. We do not know what the same aeroplane would have cost in metal construction, but we are quite certain it would be a good deal more than the wooden machine is being marketed for. That, however, is of little importance in comparison with the fact that the machine would have been impossible of achievement in metal construction. The extra weight might well have been such that but two passengers could have been carried, so that in this particular case being "old-fashioned" has resulted in an increase of 50 per cent. in payload.

For large aircraft to be flown on regular air routes the same arguments do not necessarily hold good. On British Empire routes they have to withstand changes in climate which might tax the wood construction severely. The same may be said of light aeroplanes intended for use in certain parts of the world. But we believe that the objections to wood construction have not always been based on very sound reasons. For aircraft up to some 3,000 lb. gross weight or possibly more, the mixed construction is likely to score in the matter of low weight, mainly because metal has to be of heavier gauge than that required by structural considerations if absurdly thin sections are to be avoided. Yet another advantage of wood construction is that during the development of a new type changes are more readily made, while in subsequent use repairs can often be carried out with little trouble by almost anyone able to use a hammer, chisel and screwdriver.

When the time comes to turn out light aeroplanes at the rate of thousands a week, and it becomes possible to use heavy hydraulic presses for real mass production, metal construction will come into its own. But until then, do not let us get into the habit of accepting unquestioningly the doctrine that if all-metal construction is good for Service aircraft it is good for all aircraft. And, above all, do not let us sneer at the wooden or mixed light aeroplane as something inferior, something cheap and nasty. It is not, and those who think it is are merely displaying their own lack of appreciation of the true facts.

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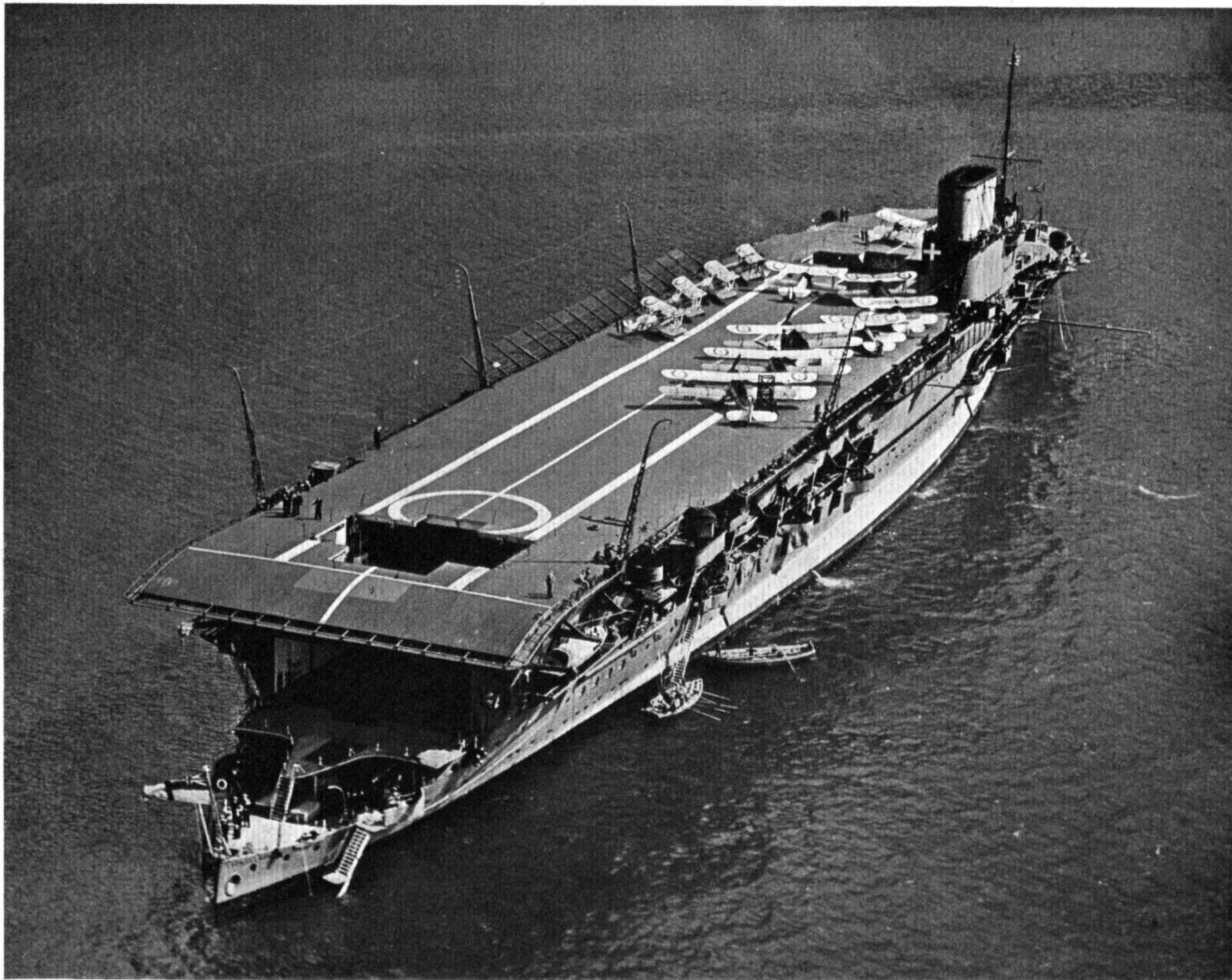
The whole civilised world has read with horror the latest developments in the sad case of the kidnapping of Col. Lindbergh's baby son. While it seemed a question of money extortion only it was bad enough in all conscience. But when not only the little child was murdered, but miserable wretches plead guilty of having perpetrated cruel hoaxes on the distracted parents, Col. Lindbergh and his wife may well feel that they can trust no one, and that the world has turned against them. In their hour of grief we should like them to know that the British aviation community, and, indeed, the whole British nation, is filled with the very deepest sympathy for them in their bereavement. Col. Lindbergh has for years been America's idol. His recent terrible misfortune and the manly way in which he has faced it has brought him the heartfelt sympathy of every Briton.

The Lindbergh Tragedy



THE HORNET'S NEST:

AN AERIAL VIEW OF THE AIRCRAFT CARRIER "COURAGEOUS." THE MACHINES RANGED ON THE FLYING DECK INCLUDE FAIREY "FLYCATCHERS" AND III F'S. NOTE THAT BOTH LIFTS ARE DOWN, PRESUMABLY TO FETCH MORE AIRCRAFT.





Short "Valetta" as a Landplane

Illustrated by FLIGHT photographs



THE "VALETTA" LAND UNDERCARRIAGE : It picks up on three of the four points used in the float undercarriage, the outer rear support being idle.

DESIGNED as long ago as 1929, and first flown in July of 1930, the Short "Valetta" was, it may be remembered, built to the order of the Air Ministry for the purpose of testing out the relative advantages, for certain classes of work, of the twin-float seaplane and the single-hull flying-boat. The "Valetta" also had the further design feature that a wheel land undercarriage could be substituted for the floats, so that the machine could be used on a long air route where



LANDPLANE AND SEAPLANE : The Short "Valetta" (Bristol "Jupiter" engines) has now been fitted with a wheel undercarriage, and has been flown as a landplane. A view of the machine as a seaplane is included for comparison.



THE TAIL WHEEL : This is of the castoring type, and is centred by the rubber cords.

certain sections were most suitable for seaplane operations, others calling, by geographical reasons, for an aeroplane. In view of the fact that the air route from Cairo to the Cape covers all manner of country, it had been generally assumed that when this air route was opened by Imperial Airways the "Valetta" would be put on certain sections of the route, first as a seaplane and later as an aeroplane. This, however, was not done—for what reason we do not know—and it was left to Sir Alan Cobham to try out

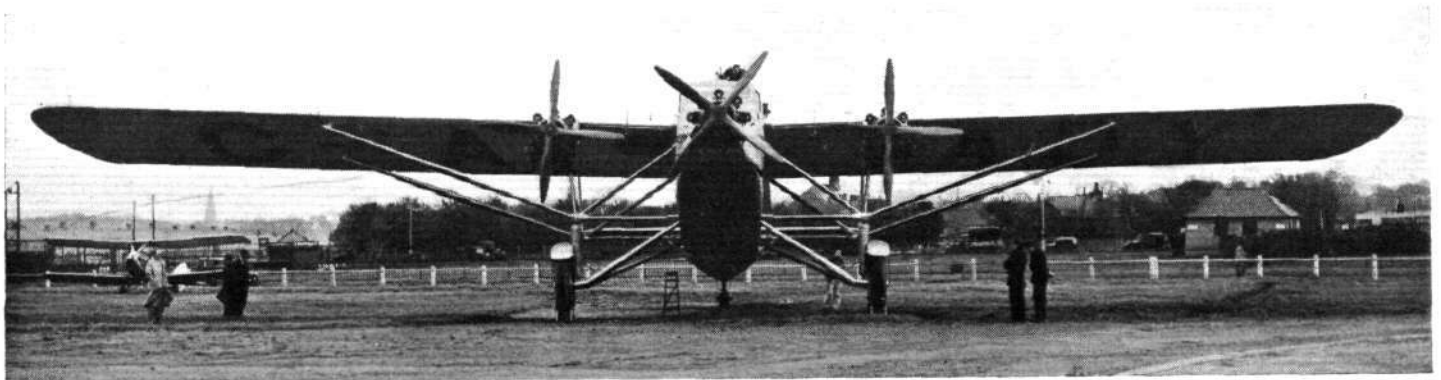
the machine in its seaplane form on an African tour which he made last year. Sir Alan returned from that tour full of enthusiasm for the "Valetta," but, in spite of this fact, it is not, we understand, the intention of Imperial Airways to make any use of the machine.

As the "Valetta" was built to the order of the Air Ministry, and is still the property of the Ministry, it may be assumed that any further work will probably be of an experimental nature, and the machine has now been fitted with its wheel undercarriage and was tested in flight on Friday last by Mr. Lankester Parker, Short's test pilot.

The "Valetta" looks curiously large on an aerodrome, much larger than she did as a seaplane on the Medway. And, of course, she is not a small machine—with a wing span of 107 ft., a wing area of 1,382 sq. ft., and a gross weight of 21,850 lb. On Friday last the machine was, of course, flying with but a small load, but the ease with which she left the ground seemed to indicate that even when carrying full commercial load, the take-off should be good. The landing run was short, in spite of the fact that Mr. Parker made "seaplane landings," *i.e.*, with the tail well up. Probably the Palmer wheel brakes had something to do with this.

Some criticism was levelled at the height of the cabin door above the ground, but it should be remembered that the machine was designed primarily as a seaplane, and that the height of the engines, etc., above water level is then a very desirable feature. The machine deserves to be put to some useful work, and it is to be hoped that the powers that be will see that this interesting experiment is not wasted.

A detailed description was published in our issue of July 25, 1930.



UNUSUAL BRACING : This front view shows the arrangement of the rigid strut bracing, which distributes landing loads in an unusually complete way.

Private Flying and Gliding

COVENTRY AERO CLUB'S BAPTISM

COVENTRY Aero Club had ideal weather for the opening meeting on Saturday, May 14, and the natural result was an unqualified success.

The crowd was large and all the enclosures were packed with cars and spectators; the only thorn in the management's flesh being the piece of common-land on the N.E. boundary of the aerodrome, for it was impossible to screen this off, and it thus formed a perfect enclosure for some thousands of "hedge-guests."

Being domiciled at Whitley Abbey, also the home of the Sir W. G. Armstrong Whitworth Aircraft factory, the Club is lucky in having the active support of people like Mr. J. D. Siddeley, Air Marshal Sir John F. Higgins, Maj. S. W. Hiscocks, Maj. F. M. Green, and Maj. W. G. McMinnies. Municipal support has also been assured the Club by the acquisition of the Deputy Mayor of Coventry (Ald. W. H. Batchelor) as President, while the Mayor (Ald. J. Wyles, J.P.) and Capt. W. F. Strickland, M.P. for Coventry, acted as stewards, and in support of the President performed the opening ceremony with excellent, well-chosen speeches, which were broadcast by means of a B.T.H. public address equipment of singular purity.

The first item on the programme was a fly-past of all the different types of aircraft present. These included:—An "Avian" (Genet Major), a "Puss Moth" (Gipsy III), a "Spartan" three-seater (Gipsy II), a "Civilian Coupé" (Genet Major), an "Avian" (Gipsy II), an Avro "Cadet" (7-cyl. Genet Major), a "Klemm" (Pobjoy), an "Elf" (Hermes II), a Comper "Swift" (Pobjoy), a "Moth" (Gipsy I), an "Avian" (Hermes II), and a representative collection which aroused quite considerable interest among the spectators, particularly as the salient features of the aircraft were adequately explained by the announcer, Mr. W. Courtenay (Hon. Sec., Press Aero Club).

The arrival competition, although it was for the first aircraft to cross the line after 12.30 p.m., did not turn out such a dangerous scramble as some thought it might, as many pilots failed to notice that this "12.30 p.m." was G.M.T. The arrivals were, therefore, strung out over a considerable period. Miss Winifred Brown, in her "Avian" (Hermes II), was the winner, with Mr. L. Marshall in the "Elf" (Hermes II) second, and Capt. J. Maxwell, "Swift" (Pobjoy), third.

After an aerobatic competition by Mr. L. Stace, "Avian" (Gipsy II), there was the start of a reliability trial wherein the competitors had to fly over a course only disclosed to them some 5 min. before the start, at a ground speed of 80 m.p.h. Flt. Lt. J. Allen was the winner in a "Puss Moth" (Gipsy III), with a time error of only 8.2 sec. Mr. L. Nelson was second on an "Avian" (Genet Major), being 32 sec. out, and Mr. L. Stace third, also in

an "Avian" (Gipsy II). The other competitors were Miss W. Brown and Mr. Gordon Store, in the three-seater "Spartan," who unfortunately lost considerable time through having some difficulty in starting his engine.

Mr. Store is shortly returning to South Africa, where he and his partner will be holding the agency for "Spartan" aircraft. The three-seater has already created a very great deal of interest in that country, and has shown that it can overcome the peculiar flying conditions to be found there in a most successful manner.

Other items on the programme included demonstrations of the "Autogiro" (F/O. R. Brie), the Avro "Cadet"—flown crazily to show off its excellent control by Mr. H. A. Brown—the A.W. XVI (Flt. Lt. Campbell Orde), and the "Atlas II" (Flt. Lt. D. S. Green), both of which aircraft were described in FLIGHT for October 16-23, 1931.

During the afternoon a flight of "Wapitis, No. 605 (County of Warwick) Bomber Squadron, A.A.F., came from Castle Bromwich, and did a little very excellent formation flying.

To round off the programme, there was a parachute drop by Mr. J. D. Price and a bombing-the-car competition.

Aerially, the meeting was well attended, some 36 aircraft of various types arriving during the afternoon. One visitor was Capt. T. N. Stack in a Spartan "Arrow," which he incidentally told us was one of the easiest aircraft to land that he had ever flown. He himself is shortly taking the Spartan "Mailplane" out to India and Egypt to demonstrate to the Government of those countries. With its load of about 1,000 lb., which it can carry for 1,000 miles non-stop, it should be an attractive proposition for postal work.

After the prizes had been presented, the meeting broke up, and most of the aircraft left for Skegness—the second meeting of the Whitsun holidays.

"SO BRACING"

SKEGNESS—bright, breezy, bracing, sunshine; amusement parks; welks and winkles; sticky pink rock; expensive lodgings and cheap restaurants—that's the impression most people have, isn't it? Well, it has a new attraction now—its Aerodrome.

Some 40 aircraft invaded its alleged bracing air last Saturday evening, bringing about 60 persons, some bent on driving its "Water Dodgems" and "Dodgem Cars" faster than they had ever been driven before—some got wet, some got bruised!—while others less energetic wrapped their aircraft in all the covers they could beg, borrow or steal and resigned themselves to the moist drizzly pall which had welcomed(?) them to this well-advertised holiday paradise.

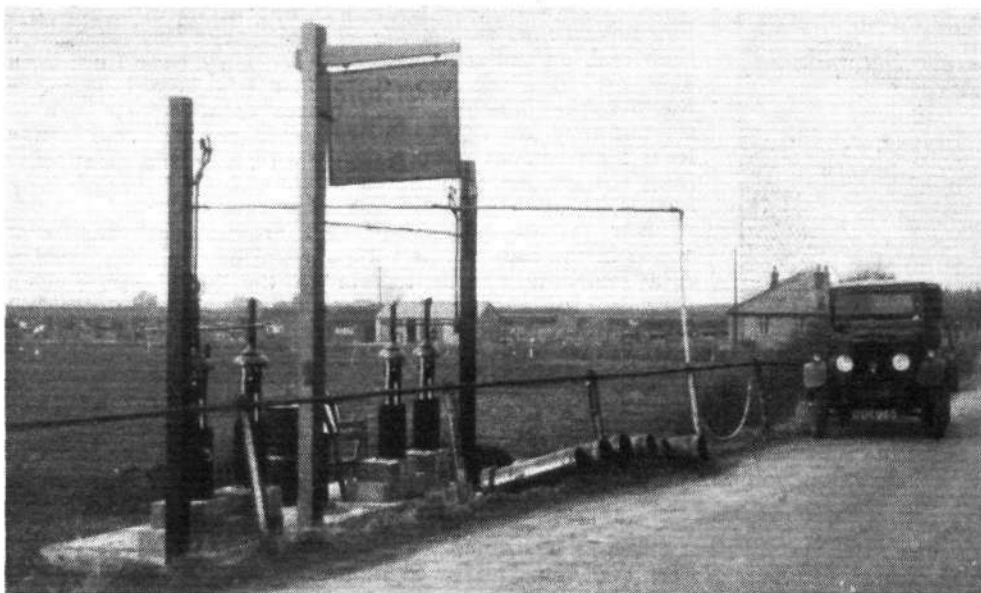
The event of the evening for all of them was, however, the Dinner given by the newly-formed Skegness Aero Club—an excellent dinner with the right consistency, length and speakers.

Councillor J. Crawshaw, J.P., proposed the health of "The Visiting Pilots," remarking that he knew they would all agree that Skegness air was the finest they had ever flown in. (True, Mr. Crawshaw, but surely there was no need to baptise us with it in a condensed and very moist form till past midday the next day.—ED.) In reply, Mr. F. D. Bradbrooke fully upheld his reputation for dealing with aviation in a light and humorous manner.

Mr. Ivor McClure opened wide the flood gates of his native wit when proposing the health of "The Skegness Aero Club," and rounded his speech off with the pleasing information that, although the club had only been formed seven weeks, yet it already had 87 members, of whom 27 were



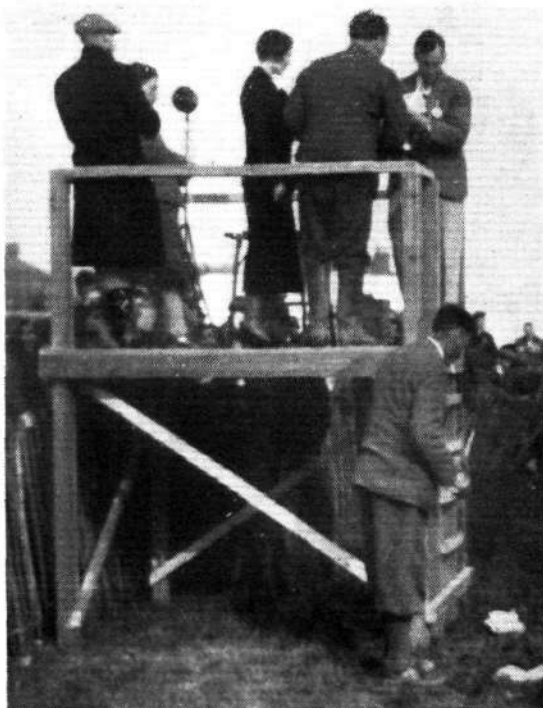
A view of the new Avro "Cadet" which Mr. H. A. Brown threw about in an amazing manner. Six of these aircraft have been delivered to the Irish Free State for training. (FLIGHT Photo.)



The line of pumps erected by Eastern Air Transport at Skegness to serve aircraft on the field or cars on the main road which borders it.

learning to fly. Capt. G. A. Pennington replied on behalf of the club and voiced the hope that everyone would enjoy their stay in Skegness.

Well, Sunday wasn't bracing; it was darn depressing. The sea mist lay on the housetops and the rain rained. However, the optimism of Mr. M. D. Scott and Capt. Pennington was evidently a potent form of ju-ju, for, by 12.30, it was already possible to see the tops of the nasty great beam-wireless masts which rear themselves near the aerodrome, and by 2.30 p.m. it was quite a passable day. At any rate, the inhabitants—indigenous and Whitsunitory—thought it worth while seeing what all the posters were describing as "The Great Air Pageant," for many thousands, probably some 20,000, came and blocked the roads for miles. Even the most blasé of them could not have been disappointed with the programme; they got superb aerobatics both in straightforward clean flying such as any well-trained pilot might hope one day to perform on the common or garden aircraft, including that excellent piece of safety propaganda—a landing without his engine running—by Flt. Lt. C. Clarkson (his own "Moth" (Gipsy II) fitted for inverted flying was, un-



Mr. Gordon Store receiving the first prize from the hands of Mrs. Pennington for the Air Race at Skegness. In the foreground Col. L. Strange reflects pensively on the excellence of his "Spartan"—which Mr. Store flew to win.

fortunately, *hors de combat* with a broken valve), and in the crazy variety by Mr. H. A. Brown, who took liberties with the Avro "Cadet" which proved him, as the announcer said, a finished pilot, but which would, had he been otherwise, have resulted in a pilot finished. Incidentally, what an extraordinary pleasant and satisfying aircraft the "Cadet" is to fly. Few machines give such evidence of the care which has been spent on the design of its controls. Flt. Lt. C. Clarkson, whose inverted flying and aerobatics are well known at all flying meetings, went into raptures over it. All the controls are almost the same weight and absolutely positive in their action. The efficiency of its design may be judged from its very flat glide, and its controllability at speeds even down below 55 m.p.h.

Miss Winifred Brown opened the Display with some neatly-executed aerobatics, and was followed by Mr. L. Stace on the "Spartan" 3-seater (Gipsy II). The "Spartan"—apart from the hard work the club 3-seater did joyriding—distinguished itself by winning the 45-mile race during the afternoon. This was flown off in two heats and a final, the heats being two laps of a 15-mile circuit and the final, three laps. The aircraft flying were: Autogiro (Genet Major), G-AAYP, R. Brie; "Moth" (Gipsy I), Sqd. Ldr. D. Carnegie; "Widgeon" (Gipsy I), C. S. Napier; "Moth" (Gipsy II), Flt. Lt. C. Clarkson; "Bluebird" (Gipsy I), J. Clayton; "Avian" (Hermes II), Winifred Brown; "Spartan" 3-seater (Gipsy II), Gordon Store; Avro "Cadet" (7-cylinder Genet Major), R. H. Dobson; "Active" (Hermes II.B), F/O. H. Leech.

The analysis of the final shows clearly the amazing accuracy of the handicapping of Messrs. Rowarth and Dancey. Especially



The start of the first heat for the Race at Skegness: (Left to right) "Avian," "Cadet," "Avian," "Spartan," "Widgeon" and Autogiro—the last, in its first race.



The winning "Spartan" 3-seater landing at Skegness after its excellent race.

should one realise that this is the first time they have had either an Autogiro or the Avro "Cadet" to handicap—no one could wish for a finer finish than the first four in 4 sec.!:—

A/c.	Engine	Pilot	Start- ing Time	Finish	Speed	Place
G-AAYP Auto- giro	Genet Major	R. A. Brie ..	0 00	18 02	93	2
G-AADE Wid- geon	Gipsy I ..	C. S. Napier ..	1 36	18 03	102	3
G-AATT Spar- tan 3-Sr.	Gipsy II ..	G. Store ..	1 45	18 00	104	1
G-ABLF Avian	Gipsy II ..	L. Stace ..	3 08	—	—	6
G-ABRS Cadet	7-cyl. Genet	R. H. Dobson	3 20	18 04	114	4
G-ABED Avian	Hermes II	Miss W. Brown	3 35	18 18	114	5

Among the other demonstrations were those of the Auto-giro, the Klemm (Pobjoy), and the "Arrow Active."

Mr. A. Gibbons puts up a truly wonderful performance on his Klemm, taking off in a matter of 10-15 yds.—stopping his engine and starting it in the air by means of his hand starter—and flying at less than 30 m.p.h. By way of contrast, F/O. H. Leech throws the "Active" about at really high speeds, and the "crowd" certainly appreciated the way the Hermes II.B engine pulled the machine up in a very steep climb on an upward spin.

Comic relief was brought in not only by bombing a strange and fearsome looking aircraft—for the design of which Mr. Roy Chadwick, of Avro's, was heard to utter a vehement disclaimer—but also by a hero from Hull riding his motor-cycle through a sheet of glass at speed.

After the usual finale of a parachute drop by Mr. H. Price, Mrs. Pennington gave away the really fine prizes to the various lucky recipients.

when they were told there was no chance of a subsidy, but nevertheless they made a "do" of it and established their club on the soundest of lines. They have since been able to claim the subsidy, which has helped them to weather the difficult circumstances of the past year or so, but they are still dependent upon getting some money from such sources as a pageant, and this lack of support from the indigenes of the countryside must have hit them severely.

Their private owner members are amongst the most active in the country, and the amount of flying they put in is a really wonderful tribute to the keen spirit which pervades the club, while few clubs have such organising talent, for getting up their displays, as have the Northamptonshire club, in the persons of the brothers Linnell; it is therefore all the more regrettable to see their display so little appreciated. This time they have the satisfaction in knowing that things might have been far worse, for even the rain did not keep everyone away, and although the public enclosures were not populated as they have been in past years, yet they contained quite a nice-sized crowd.

It really was a club show this time, and almost all the work was done by the club members themselves. As we have already said, the organisation of the flying part was mostly in the hands of the Linnell brothers, who were nobly aided and abetted by "Harry," "Vasco" and "Eaton Socon" (great place for nick-names is Sywell). The latter paid for his enthusiasm somewhat severely by getting his hand damaged during the set-piece; we should like to offer him our sympathy and hopes for a speedy recovery. The lady members all worked hard at programme selling—and incidentally did extremely well at it—and the catering department run in the club house was much appreciated.

The bad weather did not deter the flying visitors, and despite the fact that there were at least four other displays on the same day, 32 aircraft were to be seen together on the aerodrome at one time.

After the public enclosures had been showered with small soggy balloons bearing tickets for free joy-rides, Flt. Lt. W. E. P. Johnson gave a fine display on a "Tiger Moth," which was fitted for inverted flying. His flying is too well known now to need description. Everyone knows that he is a past master, not only at inverted flying but also at instrument flying, and the authenticity of this fact may be judged from the remarks of Group Capt. Baldwin, who at a recent lecture on "Training" before the R.Ae.S. admitted that, although he was until recently Commandant at the Central Flying School, he owed all he knew of instrument flying to Flt. Lt. Johnson.

Other interesting items included "Advanced Instruction from the Air," wherein the instructor who was flying a

SYWELL'S FIFTH ANNUAL DISPLAY

ALL members of the Northamptonshire Aero Club are to be congratulated on their labours which resulted in the production of their fifth annual flying display on Whit Monday, May 16 last. Congratulations are, however, insufficient compensation for work like that, and nothing we can say as regards the excellence of their efforts can negate the disheartening effect of the bad weather, with the consequent smallness of the crowd.

The fact of the matter is that the Sywell displays have always been ahead of their time, and have been too good. The local public are too air-minded; they are too used to really fine displays, and unless the weather is perfect they will not turn out. This is all very hard lines on the club, who have probably put up a stouter show than any other flying club. They started at a time



The perennial Ford—this time in the guise of the "Lizzie A. Gayne"—rams a "coastguard" cutter off Sywell during the Northamptonshire Aero Club's 5th Annual Flying Display.

club "Moth" was heard to explain his actions through the medium of the loud-speakers. An examination of that "Moth" revealed many interesting facts of modern progress, and accounted for the excellent reception throughout this item! Somewhat later Mr. Palmer (the Instructor) gave a demonstration which was calculated to show the public that stopping one's engine does not necessarily mean a crash.

F/O. H. H. Leech did his "stuff" in the "Arrow Active," and displayed the speed and controllability of that aircraft in a very finished manner, while F/O. S. McKenna gave a very fine aerobatic display on Capt. I. Maxwell's "Comper Swift." Unfortunately the arrangements for fuel feed to the engine while flying inverted did not work in the most satisfactory manner, nevertheless his manoeuvres were a wonderful advertisement for manoeuvrability for the "Swift."

Mr. Eaton shot down balloons from the air in a manner that showed his mastery of the twelve-bore, and so we came to the grand finale of the type for which Sywell is famous. Few motor-cars can have done more sterling

work than the Ford used for these shows, and rumour had it that this time was to be the end; no such fate awaited "Lizzie," however, and she lives to "show" another day. In the words of the programme:—The scene was set in the Bay at Sywell, with two coastguards fishing. Over the horizon loomed a suspicious looking craft. They hailed her. She ignored them. They fired their revolvers. She—being named the Lizzie A. Gayne—fired a gun at them, and they were finally rammed and sunk! A bombing squadron, however, approached from Overstone Ness, and with unsurpassed skill hurtled down again and again, scoring direct hits, which left the ship . . . !!!

At the dinner in the evening Miss Amy Johnson and Mr. Mollison were the guests of honour, and both thanked Mr. Shale, the chairman, in short but appropriate speeches. A dance followed the dinner, which was well attended, and though it lacked the exclusive aeronautical atmosphere of last year, it was good to see several old faces which have been missed for some time. Tommy Rose was there, but he did not as in previous years spend his time on the aerodrome "knocking the necks off bottles"!

READING

The Phillips & Powis School of Flying have taken on another pupil from abroad this week in the person of Mr. B. Karlby, a Dane, who, after taking his "A" licence here, intends to return to Denmark and join the Danish Air Force.

The fine weather during the past few days has brought many people to the aerodrome to fly, with the result that the work of the school has been quite heavy. Amongst the recent sales made by the Sales Department is that of Miss Amy Johnson's "Puss Moth," *Jason II*, to the Leicestershire Aero Club.



"Moths" of the Aero Club du Katanga outside the hangars at Elisabethville, in the Belgian Congo.

THE ISLE OF MAN RACE

On June 18, starting and finishing on the Ronaldsway Aerodrome, Castletown, there will be an air race around the Isle of Man. This will consist of two circuits of a course 52 miles in length which follows the coast line of the island, except at Peel, where it avoids a dangerous stretch on the south-west corner of the island. This race will be open to all types of aircraft and will be run in conjunction with a flying display. It is proposed that the competitors should foregather at Blackpool on the afternoon of Friday, June 17, and from thence proceed to the island under a convoy escort of a flying-boat, which will also shepherd them across the water on their return on Sunday, June 19. The organisers are the June Season Extension Committee of Douglas, but the flying side of the programme will be in the hands of the Lancashire Aero Club, while the race will, naturally, be flown under the competition rules of the Royal Aero Club. Applications for entry forms should be made to the Secretary, Lancashire Aero Club, Avro Aerodrome, Woodford, Cheshire. Owing to the limitations of the Ronaldsway Aerodrome licence, entries can only be accepted in the order they are received up to ten. Further entries will be held as reserves in case of anyone falling out. The prizes to be divided between the 1st, 2nd and 3rd will amount to a sum of £250, and there will also be a small grant towards the expenses of entrants actually starting on the course.

BRISTOL

Sir Alan Cobham will be collaborating with the Bristol & Wessex Aeroplane Club on the occasion of their Summer Flying Meeting on June 4. One of the events of the afternoon will be the race for the Air League Challenge Trophy. It is open to aircraft of all types to be flown by "A" or "B" licensed pilots. A particularly interesting course has been chosen, as with reasonable weather conditions the competing aircraft will be in view of the spectators throughout the race. Visitors to the aerodrome by road on that day are advised to travel by Whitchurch, as the club entrance is at the Whitchurch end of the aerodrome. The new ring road at the northern end of the aerodrome is not quite finished and cannot therefore be

used for the present. After the meeting there is a dance being organised at the Grand Hotel. Dancing will start at 8.45 p.m., the charge for tickets being 5s. Tables can be reserved by applying to the Manager of the Grand Hotel. There will be no club dinner and members are therefore advised to make their own arrangements. A novel competition will be held on Sunday, May 22, wherein the competitor will be blindfolded, flown by an instructor to a point some distance from the aerodrome, and then, after removing the bandage from his eyes, told to find his own way back again. For this competition the competitor may carry a map, but the compass will be covered, the idea being to test club pilots' knowledge of their local countryside. The flying charges for this competition will be at the usual solo rates.

LONDON TO NEWCASTLE AIR RACE

LONDON TO NEWCASTLE AIR RACE, SATURDAY MAY 28, 1932.

Machine.	Reg. Mark.	Engine.	Pilot.	Entrant.
Puss Moth ..	G-AAYA	Gipsy III..	The Hon. Lady Bailey	The Hon. Lady Bailey.
Sports Avian ..	G-ABED	Hermes II	Miss W. Brown..	Miss W. Brown.
Spartan ..	G-ABTT	Gipsy II ..	Lt.-Col. L. A. Strange	Spartan Aircraft Co., Ltd.
Comper Swift	G-ABUA	"Pobjoy R"	Miss F. J. Crossley	Miss F. J. Crossley.
Klemm ..	G-ABCI	Cirrus III	Capt. D. I. M. Kennard	Capt. D. I. M. Kennard.
Gipsy Moth..	G-ABLN	Gipsy II ..	H. J. Ashworth	H. J. Ashworth.
Puss Moth ..	G-ABLG	Gipsy III..	W. L. Runciman	W. L. Runciman.
Arrow Active	G-ABIX	Hermes IIb	F/O. H. H. Leech	Arrow Aircraft Co.
Gipsy Moth..	G-AAZE	Gipsy II ..	A. C. Jackaman	A. C. Jackaman.
Puss Moth ..	G-ABDM	Gipsy III..	Miss W. Spooner	W. Lindsay
Comper Swift	G-ABTC	Pobjoy "R"	Capt. I. Maxwell	Capt. I. Maxwell.
Sports Avian	G-ABIB	Hermes II	J. G. Ormston ..	J. G. Ormston.
Martlet ..	G-AAYZ	Gipsy I ..	E. C. T. or H. R. Edwards	E. C. T. Edwards.

The race will be flown from Brooklands on May 28 starting at 1.30 p.m.

Air Transport

The Curtiss-Reid "Courier"

A Canadian Mail Plane with Gipsy III Engine

THE controversy as to whether postal matter should be transported alone in special machines or should be handled in conjunction with passengers is being carried on as strenuously to-day in North America as ever, in spite of the Watres-McNary Act. By this piece of legislation, passed on April 29, 1930, the United States Government set the seal of its approval on combined mail and passenger services, and authorised subsidies to mail contractors in proportion to the number of passenger seats provided in the machines used. There are still many influential men on both sides of the international boundary, however, who favour, if not a complete divorce for these two activities, at least a judicial separation. Not that Canada is bound, or even necessarily influenced, by any action of the U.S. Government, but it is a reasonable supposition that if combined services are right in the United States, they are equally right in the very similar conditions north of the line.

J. A. D. McCurdy, doyen of Canadian aviation and presently President of the Curtiss-Reid Aircraft Company, of Montreal, is one outstanding individual who for many months has been outspoken in his belief that mail, as far as aircraft operators are concerned, is in a class by itself. Nearly a year ago Mr. McCurdy said to the writer in the course of an interview: "The essence of mail-carrying is the provision of the utmost speed and regularity consistent with the preservation of human life. This entails the taking of risks that, I should think, would eliminate passengers altogether from the picture. Even the carriage of freight and express complicates the handling of postal traffic by encouraging the use of large and expensive machines that are not, in my estimation, of the right type for the transportation of letters.

"The mail pilot's credo," continued Mr. McCurdy, "need have only two clauses: 'Get through if it is humanly possible. Do not throw your life away battling insuperable odds.' The only kind of machine in which this credo can be consistently practised is a small, fast, inexpensive, economical, single-engined single-seater. Why? Because while speed is essential, it is too dearly bought if it entails the use of hundreds of horse-power when 120 will do the trick. Because competition, if not

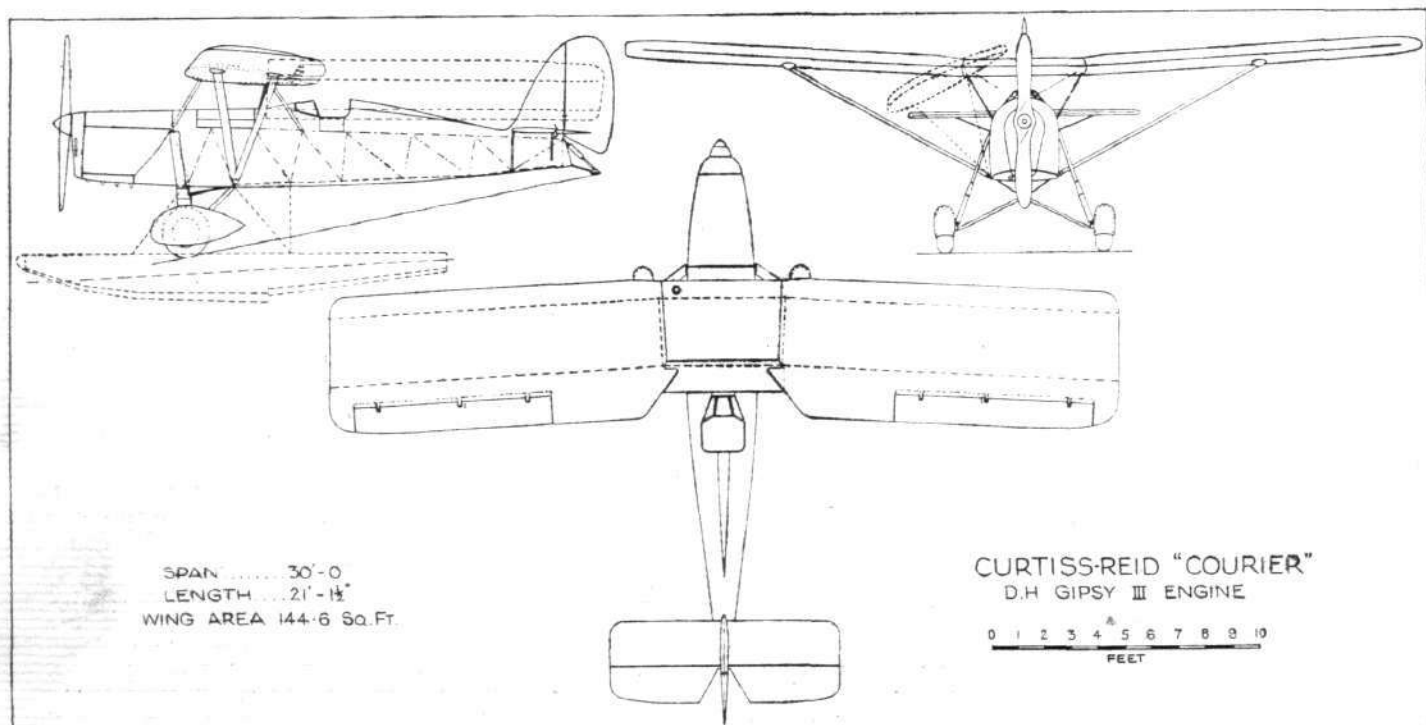
common sense, dictates that capital charges as well as operating costs be kept at a minimum. And, lastly, because in an emergency, such as fog, engine failure at night, or failure of night-flying equipment, the pilot must feel free to save his own life by the parachute route.

"If there were no other reason, the fact that so many air mail routes, both in Canada and the United States, parallel railroads and serve the same cities as these roads, makes regular night schedules definitely necessary to the conduct of an efficient service. Until this is achieved, air mail is nothing but a gesture."

Machine to fit Theories

Now, in the "Courier," designed and manufactured entirely in Canada, save, of course, for the engine, we are given a glimpse of the kind of machine visualised by Mr. McCurdy and his designer, Mr. R. N. Bell. Officially we are told that it has been "specifically designed as an air-mail carrier which can be operated economically and at high speed on routes where the volume of mail is, as yet, small." Which means on at least 50 per cent. of existing air routes all over the world.

The "Courier" is a braced, high-wing, folding monoplane of very attractive appearance. This was only to be expected when one remembers the tiny "Canadian Cub," in the design of which Mr. Bell collaborated with Mr. G. W. Saynor, both of whom brought out from England a wealth of erudition and ideas from the Blackburn works at Brough. With a span of 30 ft. and a chord—except at the centre section—of 5 ft., it is 7 ft. 4 in. in height overall and 21 ft. 1½ in. long. The power plant is the inverted D.H. Gipsy III engine, with individual stub



THE CURTISS-REID "COURIER" : General arrangement drawings to scale.



A side view of the Curtiss-Reid "Courier" mail plane, with wings folded.

exhaust pipes protruding through the bottom of the cowl- ing. The slightly swept-back wing is set somewhat above the level of the pilot's eyes, giving maximum visibility in all directions. The very neat folding gear is so designed that the trailing edges of the wings scarfe over the fully streamlined centre section, and this without the use of hinged flaps on the wings. When folded, the "Courier" has a total width of no more than 10 ft. 3 in.

Thirty Imperial gallons fill the fuel tank, which is fitted with a gauge remarkably like that on the dashboard of a Model A Ford car. The oil tank is on the underside of the fuselage, and is so arranged that it may be fully exposed to the passage of air in the summer time, and efficiently insulated in the winter months, when some of the heat is used to warm the cockpit. Approximately on the centre of gravity, aft of the engine, is the mail com- partment of 16 cu. ft., designed for a calculated load of 250 lb. Next aft again is the roomy, well-protected cock- pit, with parachute-type seat, doors on either side, and all the usual gadgets sensibly arranged on a neat, three-panel dashboard.

Normal stick control, with rudder pedals and atten- dant brake pedals are employed. Tail trimming adjust- ment of the worm and wheel type is provided on the port side. The instrument board is lit and navigation lights are supplied as standard.

With the exception of the main spars, which are of spruce, the entire structure is of metal, fabric covered, and but for the duralumin ribs of the main planes, all the metal work is welded steel tube. The split-axle undercarriage, with a track of 6 ft., incorporates long-travel oilhydraulic shock absorbers and medium pressure tyres. Balanced Bristol-Frise type ailerons, statically balanced also, give exceptionally easy lateral control, and by means of the adjustable tail plane the machine can be trimmed to fly "hands off" at any speed and loading within its range.

The "Courier" has the following specifications:—

Weight empty (but with full night-flying equipment)	lb.
Fuel, 30 gallons	1,066
Oil, 2½ gallons	219
Pilot and parachute	25
Mail	190
	250
	<u>1,750</u>

This gives a wing loading of 12.1 lb. per sq. ft. and a power loading of 14.6 lb. per h.p. Wing loading led to a discussion of landing speeds, in the course of which Mr. Bell pointed out that some extraordinary claims are often made in this respect, and that the ordinary air speed indicator becomes an "Ananias-meter" at low speeds, recording speeds lower than the actual. There is, unfor- tunately, no ruling body to certify in the matter of land- ing speeds, according to this designer. In any event, both rudder and aileron controls of the "Courier" are reported to be very good right down to stalling speed.

Performance figures, as supplied by Mr. Bell, and based on carefully checked flight tests, are as follow:—

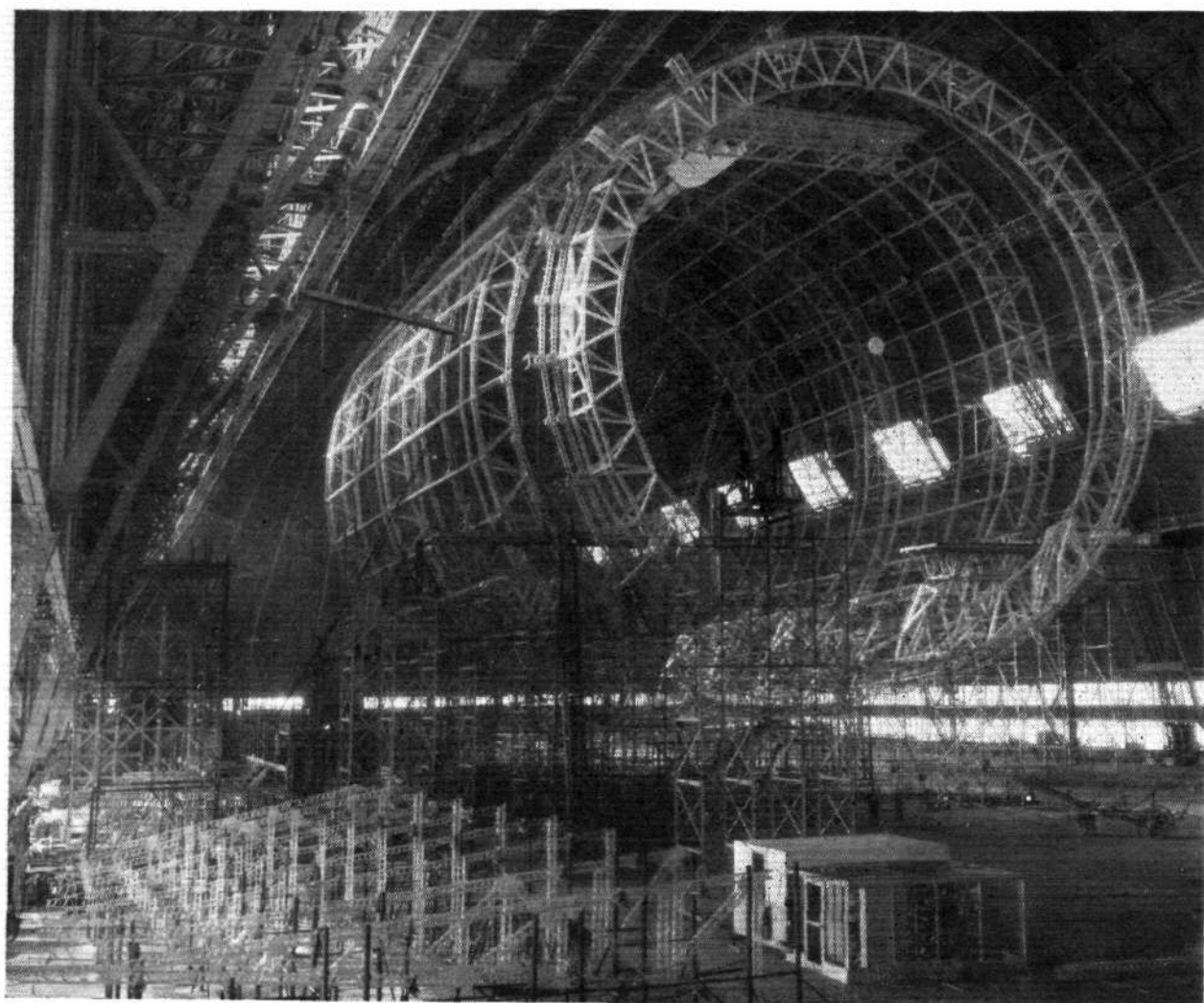
Maximum level speed with full load	137 m.p.h.
Cruising speed at 2,000 r.p.m.	118 m.p.h.
Rate of climb from ground with full load	820 ft./min.
Cruising range	550 miles.
Service ceiling	15,000 ft.

The pity of it is that the present curtailment of practi- cally all expenditure on air mail and most other aerial activities in Canada makes this an inopportune time for the production of even such an economical machine as this. One would very much like to see some sportsman like the late John C. Webster enter this machine for this year's King's Cup Race.

A. H. S.



Front view of the Curtiss-Reid "Courier" mail plane; it is fitted with an inverted "Gipsy III" engine.



The U.S.S. "Macon"

Construction of New American Airship Well Advanced

EXTREMELY rapid progress is being made in the construction of the sister ship to the U.S.S. *Akron*; the new airship is to be named the U.S.S. *Macon*, and is being built by the Goodyear-Zeppelin Corporation, who constructed the U.S.S. *Akron*.

With the raising of the sixth main frame, the duralumin skeleton of the *Macon* attained a length of more than 350 ft., and the after portion of the hull is nearing completion. Work is also well under way on construction of the ship's fins, to which the movable control surfaces necessary to guide the craft through the air are fixed.

Basic design and construction of the *Macon* are identical with the U.S.S. *Akron*, and for that reason the highly trained group of Goodyear workmen who built the first ship are able to accomplish their tasks on the *Macon* with greater speed, due to their previous experience.

Another advantage is that the *Macon* is being constructed in the tremendous hangar built for the *Akron*. This will materially assist in the saving of time in the construction of the new ship.

Since a better production schedule can be maintained, different procedure than with the *Akron* is being followed on the present ship. For test purposes and other reasons it was necessary to start amidships and erect the forward part of the hull of the *Akron* first. Starting forward of amidships on the *Macon*, construction has been carried on towards the stern.

The main frame just erected is the last and smallest in the after part of the hull structure, and there remains only attachment of the cone-shaped stern section and the fins to complete this portion of the ship.

When completed, the entire hull of the *Macon* will have a total of 11 main frames, spaced approximately 74 ft. apart in the midship portion of the ship. All but one of them are triangular in cross section, being composed of two outer annular rings joined to an inner annular ring by a system of girders in zig-zag fashion, and are connected to each other by a series of 36 longitudinal girders. Spaced at intervals between the main frames are intermediate frames of single-girder construction.



The "Akron's" Trans-American Flight

THE U.S. Navy airship *Akron* completed her flight from Lakehurst across the United States to San Francisco with a minor tragedy. After fighting a terrific storm over Texas, as reported last week, the airship succeeded in reaching San Diego, California, on May 11, where an attempt was made to moor for refuelling. During several attempts to walk the airship to the mooring mast one of the land lines broke and the airship suddenly rose. All save three of the ground party let go the ropes, but the three were carried up several hundred feet. Two of them fell to the ground and were killed, but the third made

himself fast to the rope and was hauled up into the airship after an unpleasant hour or so in midair. The *Akron* was eventually moored later in the evening, and continued her flight next day to San Francisco, where a mail of 47,000 letters and postcards was handed over to the postal authorities.

"Los Angeles" to be Scrapped?

It is reported from Washington that the U.S. Navy airship *Los Angeles* is to be decommissioned and put out of service on June 30. The *Los Angeles* was originally the Zeppelin L.Z. 126, and was completed at Friedrichshafen in 1924, being flown to Lakehurst later that year.

Airport News

CROYDON

WEATHER does not improve to any extent, but in spite of the fact passenger traffic seems to be on a definite increase, and there is every sign that this year will be a record one. On Tuesday a party of British M.P.'s. travelled to Copenhagen by the K.L.M. service to attend a conference. I believe this is the first time that such a party have travelled by air.

Mr. Campbell Black, of Wilson Airways, Kenya, arrived on Saturday in a "Waco" machine. This is the same machine in which he forced landed in France some few weeks back, when bringing a passenger from Kenya to London. He left for Heston after his call here.

Lord Dalkeith chartered a special from Personal Flying Services to take him to Berck on Friday. Saturday saw the inauguration of the first aerial tour, when Mr. Rogers took "Heracles" to Basle. These tours are to be a regular feature, and the Polytechnic people are the organisers. The machine carried a full load, in fact, many passengers had to be refused. Polytechnic Tours, Ltd., have certainly got their eye to business and can no doubt see a great popularity for air travel.

British Air Transport, Ltd., have acquired a new 3-seater Spartan, and this machine has been busy joy-riding over the Whitsun Holiday, as weather would permit.

General Aircraft, Ltd., have had one of the new monoplane's out on test, and they appear to be very fast.

The Short Valletta land version has also been on test, and took off without much effort. The trouble that has been experienced with the tail wheel seems now to have been definitely overcome.

The new radio beacon has had preliminary tests, but whether the results were satisfactory or otherwise has not been divulged. The only thing known is that the anticipated interference with the local residents' radio sets failed to materialise, and they can still enjoy their programmes as in the past.

Whit Monday has opened with the outlook to which we are accustomed. Low cloud, rain and a picture of utter misery. The country seems to have gone mad this last few years as regards weather. The holidays always seem worse.

The language being used by the joy-riding firms is not fit for publication, but one sympathises with these people to whom these holiday periods mean so much. The only people who will be pleased to see bad weather will be proprietors of cinemas and public houses. However let's keep smiling.

The traffic figures for the week were:—Passengers, 1,031; freight, 47 tons. P. B.

FROM HESTON

SUNDAY, May 8 (*Late Notes*).—Flt. Lt. Ivins returned just before dusk on G-EBIO (Bristol Fighter, 1918, Hispano engine) from Jersey. He made the journey in the quick time of 1 hr. 35 min. Flt. Lt. Ivins, who frequently makes this journey, carries a collapsible boat for use in the event of being forced down in the sea.

Monday.—One would have thought the weather would render flying impossible, but the Hon. Mrs. Montague, accompanied by Mr. Rupert Bellville, braved the elements and left Heston for a private landing ground near Lymington.

Mr. Nigel Norman, Director of Airwork, Ltd., made a business trip in a "Puss Moth" which he has recently acquired. This machine has been repainted and looked extremely effective in its colouring of Titanine bronze.

Tuesday.—Henlys, Ltd., report having sold a three-seater "Spartan" to Mr. Waters for use with Mr. John Trunam's circus.

Favoured by suitable weather, Airwork School of Flying were kept busily engaged up to 8.50 p.m.

Wednesday.—Mr. D. P. Stanfield carried out his first solo flight after 4 hr. 10 min. dual instruction.

The "Puss Moth" of the Banco left for Berck, piloted by Mr. Sydney St. Barbe, with Brig.-Gen. A. C. Critchley as passenger, and returned the same evening.

Thursday.—Another busy day for the Flying School at Heston, instruction being continuous until 8.40 p.m.

Mr. Meny arrived from Paris in his "Puss Moth," and Mr. Shipside from Ostend in his "Moth."

Banco made another trip to Berck in their "Puss Moth," Mr. Dale Bourn, the noted golfer, being the passenger.

Friday.—Many private owners left Heston to-day by air for the Whitsun holiday. A considerable number began a tour of England, but the following cleared Customs for abroad:—

Two machines, each with a passenger, for Amsterdam, from where they are proceeding to Berlin and Warsaw, returning *via* Hamburg.

One, with a passenger, to St. Ingelvert.

Two machines for Paris, one to Jersey, one to Rotterdam for Berlin, Warsaw and Hamburg.

Banco made another journey to Berck with their "Puss Moth," carrying two passengers.

Personal Flying Service "Desoutter" returned from Berck.

Saturday.—The "Desoutter" of Personal Flying Ser-

vices, Ltd., piloted by Mr. Ledlie, left with one passenger for Vienna.

Two machines (one Avro "Avian" and one "Puss Moth") left for Paris. Banco took another passenger to Berck in a "Puss Moth."

Mr. Loel Guinness cleared Customs and left for Cannes in his "Puss Moth."

With the sudden arrival of bright, sunny weather, many members and visitors found it more pleasant to sit on the lawn outside the club-house than engage in more active pursuits. We were delighted to see Maj. H. W. Butler, Equerry to H.R.H. Prince George, once more with us.

Sunday.—Banco made two trips to Berck, with two passengers during the morning, and with one passenger at 6 p.m.

Mr. Campbell Black's machine VP-KAP ("Waco," with Wright "Whirlwind" engine) aroused considerable interest, and quite a small crowd watched him give a demonstration of its performance.

Two interesting visitors came to Heston to-day—one, Herr Theo Osterkamp, Leiter der Seeflugstation, Kiel-Holtenau, claims to have brought down 32 British aviators during the Great War, but he was pleased to say that of these 24 were still alive. His one desire is to hold a reunion with the survivors of his aerial combats. The other was Herr Hans-Karl von Tresckow, of the Sea and Airplane Station at Norderney.

Owing to rain and ground mist, it was impossible to carry out any flying instruction during the morning, but after lunch the weather cleared and the School was fully occupied until dusk.

During the afternoon eliminating trials were carried out in preparation for the Household Brigade Flying Club landing competition, the final of which will be carried out during the Brigade meeting on Wednesday afternoon, May 18. The first five in the Madocks Cup to date are:—L. Grey Sykes, Scots Guards, R. of O.; J. Harrison, Grenadier Guards; Capt. J. Hargreaves, Grenadier Guards; R. L. Preston, Coldstream Guards; Capt. J. O. E. Vandeleur, Irish Guards.

Airwork, Ltd., have arranged to issue season tickets for the Heston Verandah, where the flying at Heston can be watched in comfort by the general public. The Verandah has its own restaurant where tea and other refreshments are available.

Airisms from the Four Winds

Our Flying Princes

AFTER attending the funeral of President Doumer the Prince of Wales flew from Paris to Hendon on May 12 in time to attend the Court. On May 16 Prince George, accompanied by Maj. Humphrey Butler, flew from London to Plymouth on a two-days' visit to Devon and Cornwall. Prince George will probably fly to the Isle of Man next month to attend the Senior Tourist Trophy Race.

Paris-Jibuti-Dakar-Paris

THE French African tour, to which we referred on April 22, has been completed very successfully, and has added another chapter to the story of French Colonial Aviation. Flying a Farman F.190 monoplane fitted with 240 h.p. Lorraine "Mizar" engine, MM. d'Estailleur-Chanteraine, Freton (pilot) and Mistrot (engineer) left Paris on April 15 at 2 p.m. The first landing was made at Perpignan at 6.40 p.m. Distance 500 miles. On April 16 a start was made at 5.40 a.m. Oran was safely reached, and a stop made there until 1 p.m. In reaching Tunis at 5 p.m. a total distance of 1,370 miles had been covered. Starting from Tunis the next day at 8.30 a.m. a head wind was encountered which prevented the travellers from reaching Benghazi as planned, and a landing was made at Syrte at 5 p.m. On April 18 start from Syrte at 5.25 a.m., and Heliopolis reached at 3.45 p.m. Distance covered non-stop about 1,000 miles. At Cairo delays occurred, and a start was not made until 2.40 a.m. on April 19. Assuan was reached at 7.30, and after a little more than an hour's rest the journey was continued, Massaouah being reached at 4.35 p.m., with a day's mileage of 1,400 miles. On April 20 the outward journey was finished with the relatively short flight to Jibuti. A total distance of some 5,600 miles had been covered in 4 days 21 hr. The next stage in the tour was from Jibuti right across Africa to Dakar. The start was made on April 23 at 2.40 a.m., and from now onwards the journey may best be described by its dates, times and mileages: April 23, Jibuti, 2.40 a.m.—El Obeid, 6.30 p.m., 1,645 miles; April 24, El Obeid, 7.30 a.m.—Fort Lamy, 5.45 p.m., 1,050 miles; April 25, Fort Lamy, 6.05 a.m.—Niamey, 9 p.m. (halt at Kano), 930 miles; April 26, Niamey, 5 a.m., Dakar—5.05 p.m., 1,370 miles non-stop. Africa crossed in 3 days 14 hr. 23 min. The homeward journey commenced on April 28 at 11.55 a.m., and Port Etienne was reached at 4.55 p.m. From there the flight proceeded as follows: April 29, Port Etienne, 5.50 a.m.—Rabat, 5.30 p.m., 1,180 miles; April 30, Rabat, 6.15 a.m.—Le Bourget, 6.55 p.m. Total distance covered some 14,000 miles between April 15 and April 30. Well done!

Atlantic Flight Fails

AN American pilot, Mr. Lou Reichers, left Newark, New Jersey, on May 12, in a Lockheed "Altair" low-wing monoplane (Wright "Cyclone") *Liberty* with the object of flying to Paris via Newfoundland. He landed at Harbour Grace 6½ hours later, but in landing he unfortunately damaged his machine. Repairs were quickly carried out, however, and he set out across the Atlantic at

8.29 a.m. (local time, 12.29 B.S.T.) on May 13. This date being also a Friday may account for the fact that the next news of his attempt was to the effect that his machine was sighted in the water by the lookout man of the American liner *President Roosevelt* (Capt. George Fried), some 47 miles off the Fastnet Light, County Cork. In spite of a strong south-wester and heavy seas, a lifeboat was launched from the liner and the exhausted Reichers was lifted from the machine and transferred to the liner. He was suffering from a broken nose and skin lacerations. Both the machine and the lifeboat had to be abandoned.

Miss Earhart to Fly the Atlantic

MISS AMELIA EARHART (Mrs. G. P. Putnam), who in 1928 flew in the "Fokker" monoplane *Friendship* with Wilmer Stultz from Newfoundland to Wales, is to attempt a solo flight across the Atlantic from Brazil to Africa in a Lockheed "Vega."

By Autogiro to the Cape

MR. J. N. YOUNG, who left Hanworth on April 25 in an Autogiro on a flight by easy stages to the Cape, has been held up at Auxerre, but reached Marseilles last week.

Dornier DoX 3

THE second Dornier giant flying-boat, DoX 3, ordered by the Italian Government, has been completed, and was flown a few days ago from Lake Constance to the Italian Naval base at Spezzia.

International Civil Aviation

THE report of the committee of experts formed at the request of the Disarmament Conference to discuss the scheme for the internationalisation of civil aviation, reveals that the French, Belgian, Yugoslav and Polish experts favour the creation of a company for international air navigation possessing a monopoly of the European lines, while the Germans opposed the scheme on juridical, political and technical grounds, and were supported in their opposition by the British, Italian, Swedish, Dutch and American experts.

Congress of Transoceanic Airmen

GENERAL BALBO, the Italian Air Minister, has issued some details of the International Congress of Transoceanic Airmen which is to meet at Rome on May 22. The congress is being organised by the Royal Aero Club of Italy. It had, General Balbo said, been exceptionally difficult to prepare, since there had been incomplete data as to the number and names of transoceanic airmen. Nevertheless, they had all been traced and each of them had replied to the invitation, though, of course, many had been unable to accept. Between 50 and 60 airmen, representing 11 countries, were expected to take part. General Balbo paid a particularly warm tribute to the English airman, Sir Arthur W. Brown, who, having flown the Atlantic with the late Sir John Alcock in 1919, will be the senior transoceanic airman present. As such, he has been invited to reply to the speech of welcome which Signor Mussolini will make in the Campidoglio on Sunday morning in the presence of the Government and of the Diplomatic Corps. General Balbo also expressed the sympathy of the Italian



SARO "CUTTY SARKS" FOR CHINA: Two of these machines were shipped recently. They are fitted with two Armstrong-Siddeley "Genet Major" 7-cylinder engines, which give a materially improved performance; extra fuel tanks have been fitted, giving a maximum duration of 7 hours.



FROM FINLAND TO THE CAPE IN A JUNKERS "JUNIOR": As previously recorded in "Flight," Capt. V. E. Bremer, the Finnish airman, recently flew from Finland to Capetown in a Junkers "Junior" (Armstrong-Siddeley "Genet"). Our picture shows Capt. Bremer with his machine about to leave Helsingfors—actually, he flew the "Junior" and did not haul in as shown! During this trip he made two fine non-stop flights, from Naples to Tunis, across the Mediterranean, and from Cairo to Wadi Halfa—a distance of 750 miles in 7 hours.

nation for Col. Lindbergh, who had been unable to accept the invitation. During the four days of the congress papers are to be read on technical subjects, such as meteorology, wireless communication, air routes, and landing places and bases. General Balbo said that he foresaw already that discussion would be somewhat smothered by the length of several of the communications—including the "veritable book" which he and his colleagues had prepared upon their flight from Portuguese West Africa to Brazil. He was convinced, however, that the meeting would produce information of value and interest calculated to increase the possibilities of establishing regular air routes across the oceans.

Air Pilgrimage to the Holy Land

A PILGRIMAGE to the Holy Land by air is being organised by the Church and State authorities in Southern

Italy. The pilgrims will travel by the ordinary airway routes and there will be special pilgrimage aeroplanes linking up short cuts to Bethlehem.

Australian Air Operating Companies to Combine?

It is reported from Melbourne that the leading Australian air transport companies are considering a plan to pool their resources and establish with Imperial Airways improved mail services between London and the Commonwealth's chief cities.

Lost Oasis Found

WHAT is believed to be the lost oasis of Zarzura, in the Libyan desert, has been located by an expedition headed by Sir Robert Alan Clayton and Count Ladislas de Almasy. The expedition included Sqd. Ldr. Penderel and Mr. P. A. Clayton, and the party set out in an aeroplane, escorted by a motor tender.



THE CURTISS F9C.—2

A Small Aeroplane for Operation from Airships

THE Curtiss Aeroplane & Motor Co., of Buffalo, New York, recently produced a small machine—several of which are being constructed—for the U.S. Navy for operation from airships. This machine, the F-9C-2, which was exhibited at the recent National Aircraft Show at Detroit, is shown in the accompanying illustration.

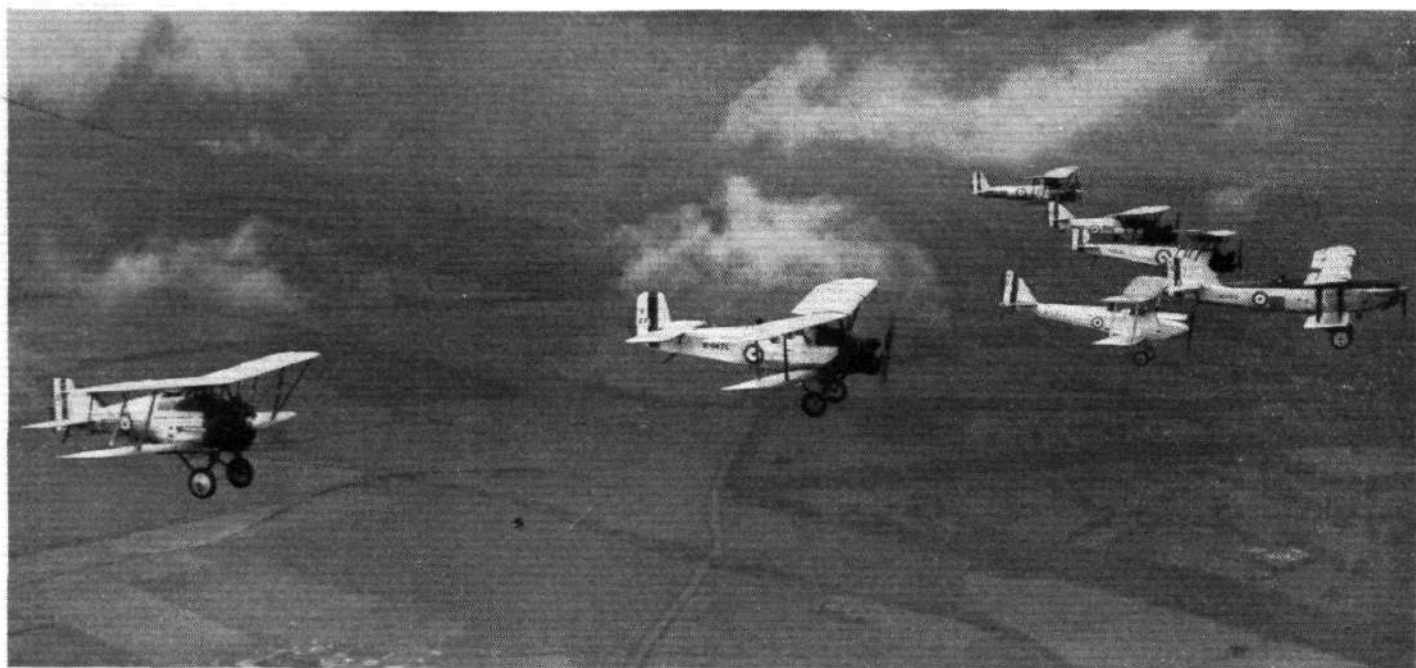
The U.S. Navy has been experimenting for a number of years with various devices for dropping and picking up planes from airships, and the lessons learned from these experiments were applied to the apparatus installed in the U.S.S. *Los Angeles*, which airship, with her limited capacity, has demonstrated on a number of occasions the feasibility of operating aeroplanes in connection with airships. In the U.S.S. *Akron* greatly increased provisions for the operation of aeroplanes have been incorporated.

Within the ship itself a considerable hangar has been built for the stowage and maintenance of planes. The gear for hooking on, hoisting and releasing planes consists of a lattice-work structure extending below the keel of the airship and carrying at its lower end a bar which engages with an overhead hook on the aeroplane. The pilot manoeuvres his plane from far below and abaft this structure and endeavours to thread the hook on the bar.

The F-9C was designed to be the smallest aeroplane which could be built around the compact Wright "Whirlwind" 420-h.p. motor, with pilot and required military equipment, since the size of an aeroplane is necessarily an important consideration in operating from an airship.

The little plane is only 19 ft. long, has a wing span of 25 ft. 6 in., has a top speed of approximately 180 m.p.h. and can climb 1,800 ft. per minute.





A FORMATION OF AIRCRAFT TYPES USED FOR INSTRUCTION AT THE CENTRAL FLYING SCHOOL: From left to right, Gamecock, Atlas, Moth, III.F, Avro-Lynx, Siskin and Bulldog. (Flight Photo.)

Training of Pilots and Instructors*

By GROUP CAPTAIN J. E. A. BALDWIN, D.S.O., O.B.E.

I WISH to make it quite clear that any opinion expressed in this lecture is merely a personal opinion, and does not tend in any way to express the official view.

As a serving officer it has been necessary for me to obtain permission to give this lecture, and a copy of the proposed lecture has been submitted to the authorities, but this in no way implies that they are in agreement with the opinions expressed in the lecture.

The necessity for a standard method of instruction in flying cannot be over-emphasised and is, I submit, equally necessary in civil flying. The public cannot yet be said to be fully alive to the possibilities of aviation, and therefore flying instruction and flying generally must be considered to be still in the development stage.

In any new venture in its development stage "safety first" is a factor of primary importance. Every year the number of miles flown steadily increases, and it is only natural that the total number of casualties should, to some extent, increase. It is impossible to impress this on the public as the existing Air Lines and the number of hours flown are not nearly so easily impressed on the mind as, for example, the length of railway lines in existence, nor is the average pedestrian likely to notice the increase in the number of aircraft using the sky (unless he has the misfortune to live near an aerodrome) in the same way as he will actually notice the increase of motor transport on the roads. He is much more inclined to notice the total number of casualties given in the daily Press and to consider that flying remains as dangerous as ever. It is therefore obvious that the first essential to popularise flying is a really sound system of instruction in the art of flying.

In dealing with the evolution of flying instruction I have divided this into three periods:—

- (a) The method employed in pre-Gosport times.
- (b) The Gosport or Smith-Barry method.
- (c) The present-day method.

Early or pre-Gosport Instruction

This really includes all instruction up to the summer of 1917. It was a period during which, to all intents and purposes, there was no true method of instruction, pupils

being more or less self-taught. The novice was given experience as a passenger and in taxiing his aircraft, *e.g.*, Blériot-Penguin. After this the pupil was told to carry out a straight flight or hop, and when considered proficient on these was allowed to carry out a circuit. During this period of learning to fly by pre-Gosport method it is fortunate that only slow aircraft were employed. With the advent of the Maurice Farman, of the Long or Shorthorn type and the 50 Avro, dual control was introduced, and a pupil was, to some extent, given a smattering of instruction as to how the controls worked. Any pupil who could make five landings without interference from his instructor was allowed to go solo. He was taught practically nothing further and had to learn the rest himself. No such thing as advanced dual was given unless the pupil crashed.

Gosport or Smith-Barry Method

This system embodied the realisation that dual instruction with adequate communication between instructor and pupil was essential. In the words of Smith-Barry: "The chief thing necessary in flying instruction is dual control." Dual control has been employed to teach every manoeuvre; flying in a wind, landing and getting off across wind, spinning, etc. The next most important thing is that quite half the dual is administered after the pupil has gone off solo, as until a pupil has himself practised a given thing he will not appreciate the details that are shown him. Bad habits are also corrected before they have had time to become fixed. This advanced dual, as it is now called, may be put down as the salient feature of the Smith-Barry system. Another innovation was that pupils were allowed to fly exactly as they chose and were not warned against doing certain evolutions which might land them in difficulties. They were encouraged to try out a manoeuvre and when by incorrect use of the controls they got into difficulties, they were shown how to get out. This was the other great innovation; after being shown how to get out of a difficult and previously considered dangerous position, the pupil was sent up again to repeat the process alone, and, in the words of Smith-Barry, if the pupil considers this dangerous let him find some other occupation; in other words, a person cannot be taught to fly by merely being taught to avoid doing certain movements. Another great difference was that instructors now taught pupils from

* Paper read before the Royal Aeronautical Society on May 5, 1932.

the passenger's seat and pupils had not the embarrassing change of seat before the first solo. I think it is correct to state that the demands of air fighting can be regarded as directly responsible for bringing about this change in flying instruction. No pilot could fight his aircraft if during the whole of the training period he had been taught nothing but how to avoid doing certain movements.

Present-Day Method

The present-day method can be said to be a mere elaboration of the Smith-Barry system. It is a comprehensive and progressive method of instruction in the air, embracing all manoeuvres which are of practical value. Efficient telephone communication is regarded as of primary importance together with numerous periods of advanced dual in which careful supervision is given to the individual's flying after the solo stage is reached. This system is worked through a sound and logical sequence of flying instruction which is, however, sufficiently elastic to be made adaptable to the different temperaments of instructors and pupils, and is assisted by careful selection of intelligent and thoroughly trained instructors; this latter condition being most important.

Selection of Instructors

In dealing with the system of instruction I propose to deal chiefly with the method by which a pilot is taught to become a flying instructor. If this is followed closely it will automatically cover the ground of "ab initio" flying training. Before commencing training as an instructor an individual must possess certain very necessary qualifications, of which I am inclined to place temperament as the most important. By no means can every good pilot be considered as likely to make a good instructor. A pupil must have complete confidence in his instructor and must retain such confidence. An instructor must therefore be a pilot with a complete and accurate knowledge of flying and airmanship and the ability to perform automatically any flying manoeuvre, added to which he must possess the power of explaining his subject in detail, and be blessed with considerable patience. Unsuitable temperaments and clumsy flying are of no use. Here arises one great difficulty; a good pilot must have a quick reaction and be able to carry out manoeuvres automatically. If he is to be a good instructor, he must be able to analyse these manoeuvres and synchronise his explanations to his actions when demonstrating. Experience has shown that pilots of experience find this a real difficulty. The careful selection of individuals as instructors is one of the most outstanding features of the present-day system. In fact this and the improvement in the good communication between instructor and pupil and the stress placed on the necessity for the instructor synchronising demonstration and speech, are approximately the only embellishments on the Smith-Barry system. The old idea that a good pilot automatically proves to be a good instructor is definitely dead.



AN EARLY "PUSHER": One of the Bristol "Box Kites" with Gnome rotary engine, on which many early pilots were trained. (FLIGHT Photo.)

The System of Instruction

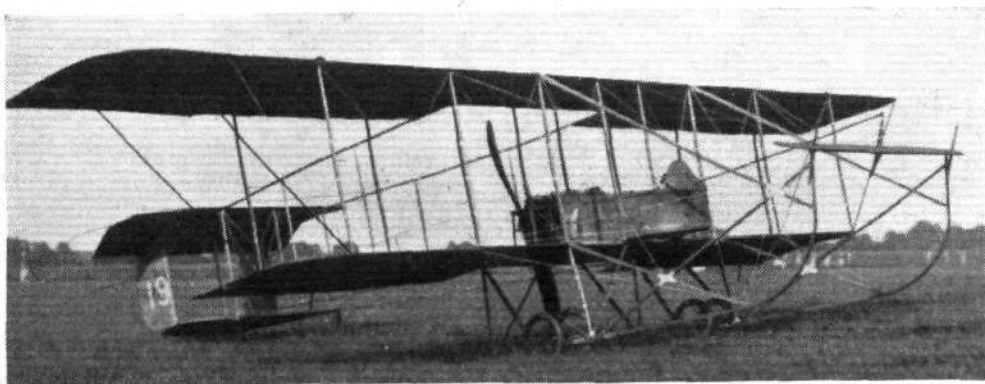
The necessity for a standard sequence of instruction, particularly for military purposes, is that it permits a change of instructor without loss of continuity of instruction, eliminates any haphazard methods, produces a finished pilot known to possess certain knowledge and to have passed certain tests. Whilst the system of instruction is thus standardised, giving continuity if an instructor is changed (although any change in the early part of the instruction is to be deprecated), the instructor must adapt this system to suit his own temperament and the individual characteristics of his pupils, and also to the type of aircraft that he is using. A great asset in flying is mobility and the method of instruction must also remain mobile and flexible to suit individual characteristics. It must, in addition, be kept up to date to suit any change in type of aircraft or change of methods of control, *i.e.*, Frise ailerons and slots. The word "patter," which describes the printed form of the Central Flying School syllabus, is unfortunate as it conveys the idea that the method can be learned parrot-fashion and this is the very thing to be avoided. In fact it was noticed that instructors were liable to attempt to become word perfect in the "patter," so now the "patter" is not issued to individuals until they have completed their course. Each individual is now instructed in the whole syllabus, which he puts into his own words when carrying out demonstrations and is only issued with his copy of the "patter" when he leaves. This copy is issued to him so that he can refer to it to ensure that he is keeping on the right lines, and also endeavour to find out any method whereby it may be improved.

Instructors' Course

The actual instructors' course at the Central Flying School is of eleven weeks' duration. This might be considered unnecessarily lengthy, but it gives the staff the opportunity to study the individual and for the individual really to absorb the necessary material. Synchronisation of speech with demonstration alone takes time; especially to do the movements slowly in order to fit in an adequate explanation to the demonstration. It must be remembered that the embryo flying instructor must be taught exactly as if he was an "ab initio" pupil, *i.e.*, before being considered fit to go solo he must be taught:—

- (i) How to handle the engine, which in these days is of comparatively high power and as yet by no means foolproof.
- (ii) To handle aircraft on the ground with safety to personnel and other aircraft.
- (iii) To fly straight, change direction, get off the ground, back on to it, and, if necessary, recovering quickly from a spin, and deal with any situation which may arise from engine failure.

All the above is considered primary dual instruction, and at the end of this stage the flying pupil can fly and may be ready



THE MAURICE FARMAN "LONGHORN": The front elevator was held to give the pilot a very useful datum line from which to judge the attitude of his machine. (FLIGHT Photo.)



THE MAURICE FARMAN "SHORTHORN" : This was a development of the "Longhorn" in which the front elevator was suppressed. (FLIGHT Photo.)

to commence solo flying practice. Unfortunately, in many schools, due to reasons to be touched upon later, this is where flying instruction ends. In the subsequent stages the pupil must be given finish in the elementary flying and instructed in the more complicated combined manoeuvres, such as gaining height during change of direction, side-slipping and losing height without a gain in forward speed, taking-off and landing across wind—the style of approach which will enable him to land exactly where he wishes, without relying on the engine—cross-country flying and sufficient knowledge and experience to handle aircraft in unfavourable weather conditions. Also a more thorough knowledge of the functions of the controls and aerobatics. Here the necessity for a system becomes apparent, as otherwise there would always be the danger of the instructor giving an undue proportion of instruction in the subject in which he himself is most interested, such as an unnecessary amount of instruction in aerobatics whilst neglecting instruction in gliding, turns and approaches.

Details of System

The selection and training of an instructor is very important if really sound instruction in flying is to be obtained, and I feel that a somewhat detailed description of the system now in force for producing service instructors is necessary.

The day is divided into three parts:—

- (i) Flying with the staff instructor.
- (ii) Ground lectures and workshops.
- (iii) Two embryo instructors practising together.

The pupil is taken in the air by the staff instructor in a dual control aircraft fitted with efficient telephones. The pupil occupies the instructor's seat and the staff pilot the pupil's seat. On the first flight the staff pilot checks over the pupil's flying; this has to be done unobtrusively. Pilots of experience frequently develop bad style and bad habits, and these have to be entirely eliminated if the pilot is to become an instructor. On the second flight practical training in instruction begins. The sequence of instruction is divided into a number of lessons. The would-be instructors are given exactly the same lessons that they will subsequently give their pupils and in the proper sequence. Each lesson is complete in detail, including the diagnosis and correction of faults. During the lesson the staff instructor describes each movement of the aircraft or engine controls whilst he actually makes it and points out the effect of the movement on the aircraft, giving the reasons for making it. In some cases the demonstrations are exaggerated to make them more marked, but are never faked. At the conclusion of the demonstration the staff pilot hands over control to the pupil, who has to repeat the lesson making his explanation coincide with the demonstration, but using his own words. He is definitely cautioned about attempting to commit anything to memory. The correct method of giving a useful demonstration is to describe exactly

what is happening. Any attempt to commit wording to memory usually leads to a species of patter which does not necessarily coincide with the demonstration being given. Preliminary lessons in the air are confined to the use of the controls separately; during this period the pupil learns to speak correctly into the telephone, analyse the effect of control movement, and begins to appreciate the "ab initio" pupil's point of view. The next period is the use of controls in combination—straight flying, climbing, gliding, taking-off, landing, and turns—exactly the same system of explanation and demonstration coinciding being used. During this period the diagnosis and correction of faults come into consideration.

When the pupil has mastered the description and demonstration of the complicated use of controls in a turn he has overcome one of his main difficulties of grasping the principles of analysing his flying. From this time he really begins to think for himself and everything is far more easy and natural for him. Next period consists of preparation for solo spinning, elementary forced landings, and low flying, and finally a lesson on testing a pupil before his first solo. By this time the instructor's own flying is automatically showing signs of increased accuracy. It will be rather a studied accuracy, but he will not be far from perfect in this respect. The following lessons are devoted to advanced dual after the pupil has done his first solo.

The would-be instructor is here taught to explain the use of the controls in the more complicated movements, and this is the period during which he himself learns style.

Each period of instruction occupies approximately 35 minutes. During this time two items of the sequence can be practised. It is not satisfactory to endeavour to cram the instruction. Having had a lesson in the morning the pupil is given a rest from flying until the afternoon, when two pupils are sent up together to practise what they have learnt in the morning. In the meantime they are occupied with the ground syllabus.

Comments on System

This very roughly sketches the sequence of instruction. This has been evolved as the result of the experience gained since the foundation of the system in Gosport times. There is always the tendency (usually after an accident) for suggestions to be put forward which would necessitate the inclusion of too many items before the first solo. This should be resisted. Any increase in the present number of items is likely to prolong unduly the amount of dual before solo and re-act on the pupil's confidence. The system provides for a thorough instruction in all the essentials before a pupil goes solo and for a continual return to dual to correct any faults afterwards; in addition to teaching the more difficult manoeuvres such as taking-off and landing across wind. No exaggerated importance is attached to teaching aerobatics, more effort being centred



THE AVRO 504 : The most popular school machine in the world. No other type has been used in such large numbers and for so long a period of years. (FLIGHT Photo.)



THE AVRO-LYNX : A development of the 504, this machine differed mainly in the engine unit and undercarriage. (FLIGHT Photo.)

on teaching the pupil to become a steady, accurate and reliable pilot. In the specialist training of instructors attention is paid to the teaching of aerobatics, as one of the first qualifications of a good instructor is that he must be a highly skilled pilot and a complete master of his aircraft. Special attention is given to spinning, but spinning is not classed as an aerobatic. It is a normal training manoeuvre. Pilots under training are given a considerable amount of spinning practice in order to get them accustomed to the sensation. Whilst admitting that most modern aircraft are reluctant to spin, the object of this training in spinning is so to impress the method of recovery on the pupil's mind, that the correct control movements become automatic to him. With the reliability of modern engines it may be suggested that the time given to forced landing practice is somewhat excessive and will seldom if ever be needed. Against this it is to be remembered that when needed there is no time to be wasted in thinking out the best method. As in spinning, the correct method must be impressed on the mind by constant practice until it becomes automatic. Before leaving the detail of instruction I should like again to impress the necessity of frequent return to dual instruction and, in order to obtain the best results from dual instruction, good telephonic communication between instructor and pupil. The instructor should never interfere with the pupil's flying except as a last resource, but should merely inform him what he is doing wrong and what it is necessary to do to correct this. I should like to quote Smith-Barry again on this subject: Dual instruction can only be effective if the pupil constantly realises that he has complete control of the aircraft. Whenever the pupil is practising any evolution the instructor should not touch the controls until absolutely necessary, and must show the pupil that he is not touching them. The length of dual instruction necessary to teach a pupil any particular manoeuvre will be very considerably cut down if this procedure is properly observed and the aircraft controlled by the pupil acting on the direction of the instructor given over the telephone. It is important that this procedure be maintained even when the pupil gets into difficulties, for it is particularly at such times that the sound of the instructor's voice giving

clear directions will do more than anything else to develop the pupil's confidence and make him feel at home in the air.

Civil Flying Instruction

Whilst many of the schools and clubs give very thorough instruction on the lines indicated, the majority are handicapped by:—

Firstly, the fact that dual instruction is paid for by the hour; and

Secondly, with a small establishment of aircraft, the serious consequence which damage to the aircraft entails.

The latter results in a certain amount of safety first methods being employed, and the former has often even more serious consequences. Under the hourly rate the pupil wishes to go solo as soon as possible to save expense (perhaps the club also has its subsidy in mind for the extra pilot's ticket), and after having gone solo many pupils take little or no advanced dual. The result is that faults arise which are not corrected, and many important parts of the training, such as advanced forced landings, cross wind landings, etc., are omitted.

Results of the System

On completion of a flying instructor's course pilots may be considered to be satisfactory instructors; most are really very good. Actual experience with pupils increases this ability, and it is no longer necessary for him to learn how to instruct by bitter experience and failure with pupils. Instructors must be encouraged to air their views. By describing their difficulties they draw attention to possibly weak points in the training system. It is in order to do this and to ensure that the standard system is not suffering variations that the staff of the Central Flying School visit all other training establishments annually. To illustrate the very real need that there is of a sound system of instruction I would like to quote some figures and which I think will illustrate how expensive the old method proved itself to be.

During the period 1914-18 there were issued to the R.F.C. and R.A.F. (exclusive of the R.N.A.S.) no less than 39,592 aircraft. Of these 18,279 were issued for training purposes.

Now with the present system of instruction aircraft at training establishments are completing their 1,000 hours.

In peace time the necessity for safety first and in war time the necessity for avoiding wastage of aircraft and personnel and of concentrating the maximum production to replace the normal war wastage, both demand a sound system of instruction. I would suggest that a civil school for flying instructors on similar lines to the Central Flying School and with power to award categories, thus preventing the employment of inefficient or unsuitable individuals, is now necessary.

(To be concluded.)

Paris Aero Show advanced a Week

M. ANDRE GRANET, Secretary-General of the Paris Aero Show, announces that the 13th International Aero Exhibition will be held in the Grand Palais, Champs Elysees, from November 18 to December 4, 1932. The dates previously fixed were November 25 to December 11.

Night Air Mails to Holland, Scandinavia and Finland

THE Postmaster-General announces that the night air service to Holland, Scandinavia and Finland, which was in operation last year, recommenced on May 2. The latest time of posting in the air mail letter-box outside the General Post Office, London, will be 5 p.m. on weekdays and correspondingly earlier elsewhere. The service will not operate on Saturdays to Scandinavia and Finland. In consequence of the resumption of flying on certain other European routes and alterations in the timing of existing air services, the latest times of posting air mail correspondence for European countries in the air mail letter-box

outside the General Post Office, London, will be as follows on and after May 2:—Weekdays: 6.45 a.m., Belgium, France, Germany (Cologne), Switzerland; 7.30 a.m., Austria, Czechoslovakia, Danzig, Estonia, Germany (Berlin), Holland, Hungary, Latvia, Lithuania, Poland, Russia, Sweden; 10.30 a.m., Denmark, France, Holland, Italy, Norway, Sweden; 4 p.m., Greece; 4 p.m. (except Saturdays), Belgium, Bulgaria, Czechoslovakia, Poland, Roumania, Turkey, Yugoslavia; 5 p.m., Holland; 5 p.m. (except Saturdays), Denmark, Finland, Norway, Sweden; 8 p.m., Austria, Bulgaria, Danzig, Denmark, Germany, Hungary, Poland, Roumania, Yugoslavia; 8 p.m. (except Saturdays), Italy. The latest time of posting air mail correspondence for Morocco will be extended to 10.30 a.m. on weekdays; for West Africa and South America, via France, to 10.30 a.m. on Saturdays; and for North Borneo, Brunei and Sarawak, Dutch East Indies, Siam, Straits Settlements and Malay States to 5 p.m. on Wednesdays.

THE SURVEY OF RIO DE JANEIRO

Aircraft Operating Company, Ltd., Completes Important Contract

THE Aircraft Operating Co., Ltd., have completed the survey of Rio de Janeiro and the Federal District of Brazil. This work, which has taken some three and a-half years to carry out, would have been finished over a year ago but for the revolution which broke out towards the end of 1930. This survey, which has proved to be a very great success from a technical point of view, marks a big forward step in the application of aerial photography to ground survey work, especially when the maps required are to be on a large scale, as is the case in the Rio survey. In fact, work which experts agree would have taken at least fifteen years to complete by ground methods alone, has been finished within three and a-half years, owing to the speeding up of the survey through the use of the aerial photographs. These photographs give a mass of valuable data, much of which is often missed by the ground surveyor, especially when working in dense areas, such as some of those in parts of Rio de Janeiro. They also provide a valuable check on the ground work, as they reduce the errors due to the personal equation, which has always been a difficulty in carrying out surveys in the past, when ground methods alone are used.

The scales, etc., on which the different parts of the area have been surveyed are as follows:—

No. of Map Sheets.	Area.	Scale.	No. of Bench Marks.
30	4 sq. miles	1/1,000	730
141	50 " "	1/2,000	
60	90 " "	1/5,000	
10	446 " "	1/20,000	

An enlargement is also being made of the 1/20,000 area to a scale of 1/10,000.

Many distinguished people have inspected the work in the company's drawing offices in Brazil and when H.R.H. The Prince of Wales visited Rio he made a very thorough inspection of the work, taking special interest in the examination of the aerial photographs in the stereoscope, an instrument which makes the ground stand out in relief. As the City of Rio is spread out in the valleys between mountains, one peak of which rises to over 2,000 ft. in height and is situated nearly in the centre of the town, it is very difficult to survey, but the photographs afford a most interesting and beautiful study in the stereoscope. At the time the Prince of Wales visited Brazil the company were having great difficulty with the authorities, as the result of the revolution. On hearing this, the Prince personally interested himself in the work, and when he was satisfied that it was well carried out, he took up the company's case with the appropriate authorities and so helped to smooth over many of the company's difficulties.

Unfortunately, the revolution broke out when the survey had reached a very important stage, and all communication with the Prefectura, for whom the contract was being carried out, ceased. At one time the revolutionaries had decided to shell the day palace of the President, near which the company's drawing offices were situated, and the police were clearing the residents out of the street. The staff, however, refused to leave the building, and fortunately the shelling did not take place. All through the revolution the work was carried out without interruption, although it was severely delayed through the co-operation of the officials of the Prefectura ceasing. At one time the staff consisted of some 130 persons and in addition to the key staff, who were British, the company employed Brazilians, Germans, Austrians and Russians, most of whom had become Brazilian citizens. The members of the staff worked happily and efficiently together.

The revolution, which was a success, proved to be a severe blow to the company, for as the result of the political turmoils and the complete change in the policy of the new Government, the company had to carry on without receiving any payments from the Prefectura for work finished. The work was also held up as the supplying of certain data, and the fiscalisation by the Prefectura officials entirely ceased. Rather than stop operations, however, Mr. Alan S. Butler, the chairman of the company,

having faith in the honesty of the Brazilian Government, continued to finance the work, and so enabled it to be completed, though at a considerable increase in the original cost, and in the face of many difficulties.

The whole of the work has not yet been handed in, and there are still some of the maps to be printed. These things cannot be done until the Brazilian authorities have recognised their debt to the company. Before the revolution the company had received payments totalling some £40,000 and work to that value had been delivered to the Prefectura. Owing to the delays, etc., arising out of the revolution and the complete cessation of the Prefectura's side of the work of the survey, the company are claiming £180,000 from the Prefectura, in order to meet the increased expenditure that has resulted.

Mr. H. Hemming, the managing director of the Aircraft Operating Co., has recently returned from Rio, where for nearly two years he has been superintending the company's work and negotiating for a settlement with the Intervenor at the Prefectura. As the result of these negotiations a Commission of Arbitration is about to sit in order to decide on the amount of money to be paid to the company under the terms of its contract with the Prefectura. It is expected that this Commission will start its deliberations any day now. At one time it was reported in the British Press that the new Government intended to cancel the contract. That was as the result of the general reorganisation carried out by the new Government, but they so recognised the value of the work, and there is now no intention of cancelling the contract, in fact, the Intervenor and his advisers have personally assured Mr. Hemming that they recognise the value of the work and wish to make use of it as soon as possible. The present delays in settlement are entirely due to the shortage of money, which is a common problem in so many countries in these days. Actually if their survey is made proper use of by the authorities, they should recover the cost of the contract from new sources of revenue for municipal taxation, which the maps and photographs will disclose. Apart from this, the survey will be of the greatest value for town planning and general municipal administration, as Rio de Janeiro is a city which is growing very rapidly indeed, and its existing maps are quite inadequate for its present needs.

Although the work has been a great success technically, the delays in payment have proved to be a severe blow to the company, for it has called for abnormal expenditure from Mr. Butler, who finances the company. In view of the financial position and of the present world crisis, Mr. Butler is reluctantly compelled to suspend for the present the company's operations. Meanwhile the company's subsidiary company, the Aircraft Operating Co. of Africa (Pty.), Ltd., will continue its work in South Africa under the management of Maj. Cochran-Patrick.

The Aircraft Operating Co. have had a most interesting record, and it is sheer bad luck that the delays in Brazil should have coincided with the world crisis. Their first big contract was with the Rhodesian Congo Border Concession Co. in that company's concession area of some 50,000 square miles in Northern Rhodesia. This contract was followed by contracts with the Government of N. Rhodesia for a survey of some 400 miles of the Zambesi River and of certain of its tributaries, as well as the mapping of several townships, and also some boundary commission work. All this work was so successful that the Government gave the company a contract to survey a further 63,000 square miles in the Colony by oblique methods of photographic mapping, and that work has now been successfully completed. Lord Passfield, when Secretary of State, gave the company a certificate, which reads as follows:—

"The Aircraft Operating Co., Ltd., have recently undertaken an aerial survey in Northern Rhodesia and have furnished the Government of Northern Rhodesia with maps of (1) the River Zambesi and certain tributaries; (2) a number of townships; (3) a considerable area of undeveloped country. The work has been performed competently and satisfactorily, and the Protectorate Government has reported well on the value of the maps produced. (Sgd.) Passfield, Downing Street, December 5, 1929."

The Industry

HOBBIES, LTD.

DESIGN and manufacture of fretwork sets and outfits for the home production of a large variety of useful articles are no doubt regarded by most people as the sole activity of the firm of Hobbies, Ltd.

This is far from the case, for although hobbies like these have been their special concern for over 30 years, they also have a foundry, engineering and woodwork shops, in which they have completed contracts for the aircraft industry for many years. Their works at Dereham, Norfolk, are practically self-contained and cover an area of many acres, while employment is usually found for about 350 people. Their machine shop is well equipped, and in the foundry they cast in non-ferrous alloys as well as iron. Their near neighbours, Boulton & Paul, Ltd., of Norwich, kindly place their approved test house at their disposal for physical and chemical tests.

For many years Hobbies, Ltd., have produced bomb gear for the Air Ministry and, incidentally, for many foreign countries. Such work, and the manufacture of practice bombs on mass-production lines, are at present occupying their shops.

The particular output of their wood-working department for use in the aircraft industry comprises dummy bombs and dummy men for parachute testing, transit plugs for smoke bombs, and an assortment of boxes for things like detonators, instruments, magnetos, tools, etc.

In the engineering department the production consists of bomb carriers of different design, and controls, fuse wires, armour-piercing bomb vanes, practice bombs, drogue release gears, engine spares, etc.

For civil types of aircraft they specialise in fittings of artistic appeal in various metals, including stainless steel and "Birmabright," and apply different kinds of finishing processes.

A comparatively new production of this firm is the Lancaster bi-metal piston of which the head is an aluminium die casting secured to a skirt

of steel tube without ill-effects resulting from the differences in rate of expansion of the two metals. It is naturally a light job and thought suitable for aero engines by the manufacturers.

The capacity of Hobbies, Ltd., foundry is 10 tons per week light castings up to $\frac{1}{2}$ cwt. grey iron, and one ton per week of brass and aluminium castings. There are six moulding machines. It is not without interest to learn that their plant for producing the vast quantities of fretsaw blades is now working at high pressure as a result of the new tariff imposed upon saws. The "Buy British" movement has also had a favourable effect upon the sale of their fretwork outfits. Various new enterprises are always being launched by the firm, and with such results that since 1926 their shops have been engaged on full-time production.

S. SMITH & SONS' NEW AGENT

FROM May 28 the address of the Scottish agent of S. Smith & Sons, Ltd., will be Mr. G. M. Smith, Horse Shoe Chambers, 21, Drury Street, Glasgow, C.2 (Telephone: Central 5382.)

PREVENTION OF CORROSION

PANALUMIN is a simple treatment for aluminium, aluminium alloys and magnesium alloys to protect them from corrosion and decorate them or prepare them for a final coating of paint or lacquer. This method of protection has been officially approved by the Air Ministry for these particular alloys.

The treatment required is the simple one of dipping the articles in a bath of Panalumin solution, which is alkaline and oxidising, and gives the articles, whether of aluminium, magnesium or

alloy, a coating of dense oxides. No electric current or plant are required. Panalumin is supplied in liquid form, and if those who propose using it possess a stoneware pot or an enamelled iron tank suitable in size for the articles to be treated they are fully equipped for the process. The alkaline solution saponifies grease on dirty articles submitted to it, but as a rule if the articles are very dirty they should be degreased before being dipped.

A highly-decorative effect is not always required on an article which has to be protected against corrosion, in which case immersion in a Panalumin solution could suffice, for it gives a smooth, clean finish in pleasing colours. Nevertheless, a final coat of paint or lacquer is recommended to prevent damage of the surface by friction or abrasion. As a protective coating alone Panalumin can give a finish in various shades of grey, bronze and iridescent effects.

As a decorative coating for aluminium articles, bronze, copper, gold, grey, and iridescent or opalescent effects may be obtained, although in this case an additional coating of transparent lacquer or clear varnish is recommended, except for iridescent coatings.

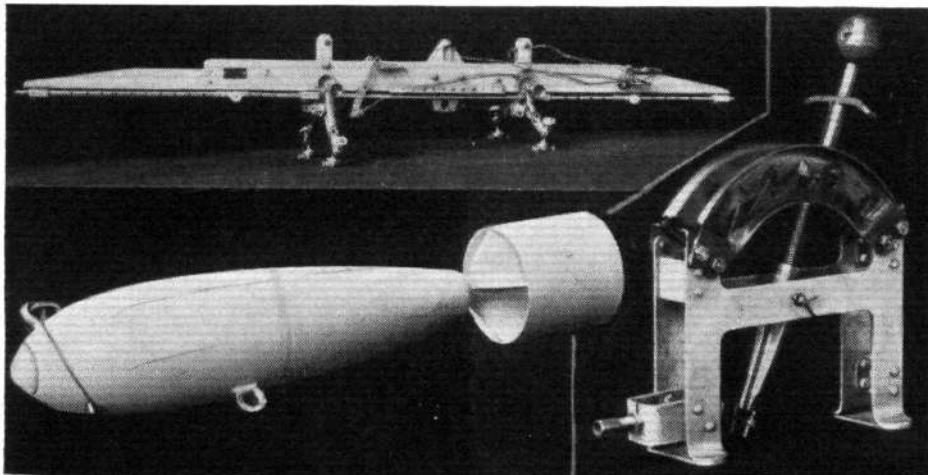
In the absence of proper treatment of a metal surface flaking and stripping, due to the formation of bulky and powdery white oxidation or corrosion products, will not only prevent adhesion but actually force paint or lacquer off the metal. For Panalumin, it is claimed that this difficulty can be overcome by immersion of the metal for a short time in a cold solution of Panalumin bronze. If immersion is impracticable the surface to be painted can be prepared with a Panalumin brushing-on solution, a method specially convenient for parts built into other structures, and for the re-treatment of metal during periodical overhaul.

For preparing the surface of aluminium or aluminium alloys for direct copper or nickel plating a short preliminary treatment in a Panalumin nickel bath is recommended. The period of immersion for articles in these solutions varies between 15 and 45 minutes, according to the solution used. After the immersion they are washed in water and allowed to dry. When the painting method is followed, three or four coats have to be applied, drying taking place between each coat, and washing in water completing the process.

The covering capacity of the solutions, which are supplied by Protective Coatings, Ltd., 7, Idol Lane, London, E.C.3, varies from 200 to 500 sq. ft. per gallon.

D. NAPIER & SON, LTD.

SIR HAROLD SNAGGE, K.B.E., has been appointed Chairman of the Company and Mr. Leonard Williams has been elected to a seat on the Board as an Executive Director. Mr. Frederick A. Davies, who is also a Director of the Company, retains his position as General Manager.



Typical productions of Hobbies, Ltd. This photograph shows at the top a bomb carrier, on the right a bomb release, and left, a bomb.

MEMORIAL TO No. 39 (H.D.) SQUADRON

A MEMORIAL to the first Home Defence squadron to be formed during war (No. 39) was unveiled on May 15 by Air Commodore T. C. R. Higgins, C.B., C.M.G., at North Weald Aerodrome, Essex. The memorial is in the form of a bronze tablet bearing the inscription: "No. 39 (H.D.) Squadron, R.F.C. and R.A.F., North Weald, 1916-1919. To the memory of those members of the squadron who gave their lives for their King and Country during the Great War." The memorial was dedicated by the Chaplain of the Station.

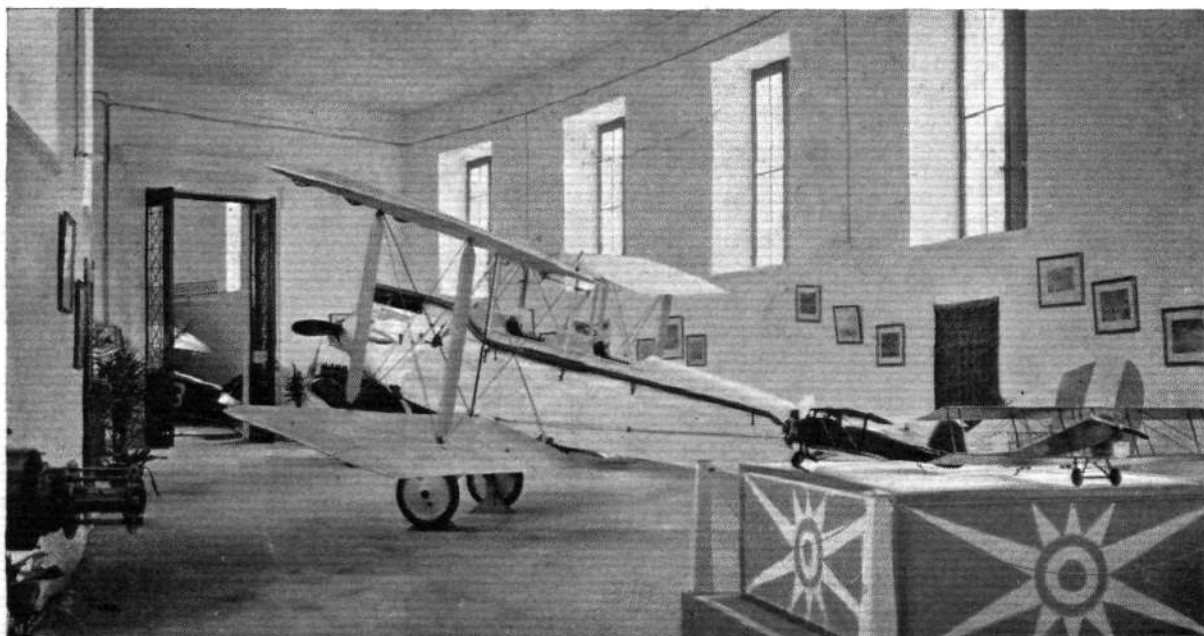
No. 39 is now a bomber squadron, equipped with the "Hart," belongs to No. 2 (Indian) Wing, and is stationed at Risalpur in the North-West Frontier Province. The squadron was formed at Hounslow on April 15, 1916, with Maj. T. C. R. Higgins as its first commanding officer. The machines were of the B.E.2.C., B.E.2.E. and B.E.12 types. The object of the squadron's formation was defence of London against raids by Zeppelins. The squadron met with its first success on the night of September 2/3, 1916, when 16 German airships raided England. Lt. Leefe Robinson, of No. 39 Squadron, was one of the pilots who went up that night in defence. He took off from Sutton's Farm about 11 p.m. with orders to patrol between there and Joyce Green. He climbed his B.E.2.C. to 12,000 ft., and at 2.5 a.m. he saw an airship caught in beams in the north-east of London. Sacrificing height to speed, he dived towards the ship, and closed with it, despite heavy anti-aircraft fire from the ground. In his report he wrote: "I flew about 800 ft. below it from bow to stern and distributed one drum along it (alternate New Brock and Pomeroy). It seemed to have no effect. I therefore moved to one side and gave it another drum distributed along its side—without apparent effect. I then got behind it (by this time I was very close—500 ft. or less below) and concentrated one drum on one part (underneath rear). I was then at a height of 11,500 ft. when attacking Zeppelin. I hardly finished the drum before I saw the part fired at glow. In a few seconds the whole rear part was blazing. When the third drum was fired there were no searchlights on the Zeppelin and no anti-aircraft was firing. I quickly got out of the way of the falling blazing Zeppelin, and, being very excited, fired off a few red Very's lights and dropped a parachute flare. Having very little oil and petrol left I returned to Sutton's Farm, landing at 2.45 a.m. On landing I found I had shot away the machine-gun wire guard, the rear part of the centre section, and had pierced the rear main spar several times." The blazing S.L. II fell at Cuffley, and burnt for two hours on the ground. Leefe Robinson was awarded the V.C.

On the afternoon of September 23, 1916, 11 Zeppelins set out for England, but only the three newest, L31, L32 and L33, approached the London area. L33, commanded

by Böcker, was on her maiden voyage. He bombed Bromley-by-Bow, Bow, and Stratford, doing considerable damage and killing 11 and injuring 26 people. But he was fired at and one shell passed through the ship, another damaged a propeller, and splinters pierced her gas bags. Böcker turned for home, losing gas fast, but near Chelmsford he was met by 2nd Lt. A. de B. Brandon, of No. 39 Squadron, who fired at L33 for 20 minutes. The Zeppelin landed at Little Wigborough and the crew set her alight. The airship was not wholly destroyed, and served as a model from which we built R.33. L32, under Com. Peterson, had worse fortune. Peterson was heavily fired at by the guns, and tried to escape, but over Essex he was caught by some searchlights and they brought 2nd Lt. F. Sowrey, of No. 39 Squadron, to the attack. At 12.45 a.m. he found her and his third drum set her aflame. She fell at Billericay and burned for 45 minutes.

On October 1, 1916, No. 39 Squadron had its fourth success. This time the hero was 2nd Lt. W. Tempest, who rose from North Weald Bassett Aerodrome at 10 p.m. The victim that night was Mathy, the ablest and most resolute of all the Zeppelin commanders. He brought the L31 in over Lowestoft, but could not penetrate the defences of London. He manoeuvred about to the north west, and dropped most of his bombs at Cheshunt, where one woman was injured. He could not shake off the searchlights. Temple was over south-west London when he saw the pyramid of searchlights in the north west, and at once flew towards them. She was at 11,500 ft., and Tempest was at 15,000. He gradually overhauled her, but his mechanical pressure pump went wrong, and he had to use his hand pump to keep up pressure in his petrol tank. He was slightly faster than the airship, but L31 was climbing "like a rocket." So he gave a tremendous pump to the tank and dived straight at her, firing a burst into her as he came. He gave another burst as he passed underneath, and then sat under her tail, and, flying along underneath her, pumped lead into her for all he was worth. He saw her begin to go red inside like an enormous Chinese lantern, and then a flame shot out of the front part of her. Tempest put his machine into a spin, and just managed to corkscrew out of the way as she shot past roaring like a furnace. He watched her hit the ground at Potter's Bar. The German airship service never recovered from the loss of Heinrich Mathy. No. 39 Squadron had done its work, and it never again got a chance of bringing down a German airship in the London area.

In October, 1918, No. 39 was re-equipped with "Bristol Fighters" and sent to France. Five days after the Armistice it was disbanded. On July 1, 1919, it was re-formed as No. 39 (Bomber) Squadron, and, as stated above, it is now stationed in India.



AT THE ATHENS AERO SHOW: The de Havilland "Gipsy Moth" which was one of the British exhibits at the recent International Aero Show at Athens.

THE ROYAL AIR FORCE

London Gazette, May 10, 1932.

General Duties Branch

G. D. M. Blackwood is granted a short service commn. as Acting Pilot Officer with effect from and with seny. of April 25; Lt.-Cdr. F. W. H. Clarke, R.N., is re-attached to R.A.F. as Flight Lieutenant with effect from April 25 and with seny. of Jan. 1, 1929. The follg. Pilot Officers on probation are confirmed in rank (May 6):—M. Hare, A. J. Hicks, T. H. L. Nicholls, J. Ramsden, D. Sloan, S. W. F. Smyth, A. Threapleton, G. F. Wood. The follg. Pilot Officers are promoted to rank of Flying Officer:—J. J. Murphy (April 10); T. P. Gleave, R. A. R. Rae (April 12); J. G. Glen (April 14); A. McD. Bowman (April 22).

Sqdn. Ldr. H. M. Massey, M.C., is restored to full pay from half pay (May 2); Group Capt. W. H. Primrose, D.F.C., is placed on half-pay list, Scale A (April 20). The follg. cease to be attached to the R.A.F. on return to Naval duty:—Lt. E. R. Carnduff, R.N., Flight Lieutenant, R.A.F. (April 25); Lt.-Cdr. F. W. H. Clarke, R.N., Flight Lieutenant R.A.F. (May 2).

Sqdn. Ldr. R. B. Munday, D.S.C., A.F.C., is placed on retired list on account of ill-health (May 5); F./O. F. D. Lockwood is placed on retired list on account of ill-health (May 5); Flt. Lt. G. G. Mobsby is placed on retired list (May 7); Flt. Lt. W. E. P. Johnson, A.F.C., is transferred to Reserve, Class A (May 8).

Stores Branch

The follg. Flying Officers on probation are confirmed in rank:—C. W. Goodchild, M.B.E., R. E. P. Paynter, D.C.M. (April 13); G. A. Durnford (April 16).

ROYAL AIR FORCE RESERVE RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. Pilot Officers on probation are confirmed in rank:—J. A. Slater (April 7); I. R. Parker, (April 9). The follg. Pilot Officers are promoted to

rank of Flying Officer:—E. Cramp (Nov. 15, 1931); C. Watson (April 15). The follg. Flying Officers are transferred from Class A to Class C:—G. H. G. S. Jenkins (April 21); C. E. Kay (April 23). F./O. M. Spurway is transferred from Class AA (ii) to Class C (July 15, 1931); F./O. E. P. Swallow is transferred from Class C to Class AA (ii) (May 2); F./O. G. D. M. Blackwood relinquishes his commn. on appointment to a short service commn. in R.A.F. (April 25); Sqdn. Ldr. C. D. Stewart relinquishes his commn. on completion of service (May 3). The follg. Flying Officers relinquish their commns. on completion of service:—W. T. W. Ballantyne (April 6, 1931); E. K. Rayson (Sept. 13, 1931); F. E. W. Davis (April 18); R. P. S. Taylor (April 27)).

F./O. J. E. Hunt relinquishes his commn. on completion of service and is permitted to retain his rank (April 20).

Erratum

In Gazette of March 29, for Ronald Watson Jones read Ronald Watcyn Jones.

SPECIAL RESERVE

General Duties Branch

J. H. Becher is granted a commn. as Pilot Officer on probation (April 19).

AUXILIARY AIR FORCE

General Duties Branch

No. 601 (COUNTY OF LONDON) (BOMBER) SQUADRON. F/O. A. G. Haward relinquishes his commn. on completion of service (Jan. 25).

No. 605 (COUNTY OF WARWICK) (BOMBER) SQUADRON. F/O. J. F. C. Brinton relinquishes his commn. on completion of service (March 15).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commanders: C. H. B. Blount, O.B.E., M.C., to H.Q., Iraq Command, Hinaidi, 21.4.32, for Engineer Staff Duties vice G/Capt. C. D. Breese. G. C. Bailey, D.S.O., to No. 70 (B.T.) Sqn., Hinaidi, Iraq, 21.4.32, to command vice W/Cdr. C. H. B. Blount, O.B.E., M.C. L. H. Slatyer, O.B.E., D.S.C., D.F.C., to R.A.F. Depot, Uxbridge, 2.5.32, whilst attending Senior Officers' Tactical Course, Portsmouth.

Squadron Leader: H. M. Massey, M.C., to R.A.F. Depot, Uxbridge, 2.5.32, whilst attending R.N. Tactical Course, Portsmouth.

Flight Lieutenant: R. Pyne, D.F.C., to No. 17 (F) Sqdn., Upavon, 30.4.32.

Flying Officers: V. Q. Blackden to No. 28 (A.C.) Sqdn., Ambala, India, 16.4.32. H. H. Martin to No. 216 (B.T.) Sqdn., Heliopolis, Egypt, 18.4.32. W. P. J. Thomson to No. 31 (A.C.) Sqdn., Quetta, India, 16.4.32. M. R. Kelly to Aircraft Park, Lahore, India, 11.4.32. W. T. F. Wightman, to No. 35 (B) Sqdn., Bircham Newton, 2.5.32. G. E. B. Stoney to No. 4 (A.C.) Sqdn., S. Farnborough, 2.5.32. S. W. H. Egan, to No. 208 (A.C.) Sqdn., Heliopolis, Egypt, 29.4.32. M. Q. Candler to No. 202 (F.B.) Sqdn., Malta, 29.4.32. D. J. Alvey to No. 6 (B) Sqdn., Ismailia, Egypt, 29.4.32. T. J. MacDermot to No. 202 (F.B.) Sqdn., Malta, 29.4.32. The undermentioned

Flying Officers are posted to Elec. and Wireless School, Cranwell, on 25.4.32:—B. T. Shelley, C. B. Hughes, J. G. W. Weston, A. G. Adnams, E. C. Passmore, J. Cherrill, T. W. Hodgson, E. M. F. Grundy.

Stores Branch

Flying Officers: F. G. Lee, to No. 14 (B) Sqdn., Amman, Palestine, 21.4.32. E. N. Lowe, to No. 605 (County of Warwick) (B) Sqdn., Castle Bromwich, 28.4.32.

Pilot Officers: The undermentioned Pilot Officers are posted to Home Aircraft Depot, Henlow, on 18.4.32:—E. G. Ambridge, J. H. Barnes, C. F. Harrington, A. R. Morton, S. W. Needham, K. N. Smith.

Accountants Branch

Flying Officers: H. Crowther, to Station H.Q., Kenley, 3.5.32. D. Sender, to Air Armament School, Eastchurch, 4.5.32.

NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—

SUB-LIEUTS.—D. J. O'Brien, D. J. C. Wise, V. W. Dobson, R. D. L. Dickson, R. J. Cooper, attached R.A.F., to join R.A.F. Base, Leuchars, May 17.



THE FLYING VICEROY

H.E. The Viceroy and Lady Willingdon arrived by aeroplane at Peshawar on the 16th April, to install the new Governor of Province (Sir Ralph Griffiths), and to inaugurate the new Legislative Council. In the photo are seen Lord Willingdon, shaking hands with Lady Griffiths. Lady Willingdon has just descended from the Avro 10 and is going to shake hands with Sir Ralph Griffiths (Chief Commissioner of the North-West Frontier Province and Governor Designate).

R.Ae.S. Conversazione and Garden Party

THE Royal Aeronautical Society, with which is incorporated the Institution of Aeronautical Engineers, will hold a *Conversazione* on the evening of Thursday, May 26, 1932, in the Science Museum, South Kensington, by kind permission of the Director, Col. Sir Henry Lyons, F.R.S. During the evening, the 20th Wilbur Wright Memorial Lecture will be delivered by Mr. H. E. Wimperis, C.B.E., F.R.Ae.S., Director of Scientific Research. The lecture will be entitled "Some New Methods of Research in Aeronautics." The lecture will be illustrated with a film specially taken for the occasion. The approximate programme for the evening will be:—8.30-9 p.m.—Reception by the President, Mr. C. R. Fairey, M.B.E., F.R.Ae.S., and the Council. 9.15-10 p.m.—Delivery of the 20th Wilbur Wright Memorial Lecture by Mr. H. E. Wimperis, C.B.E., F.R.Ae.S. 10-midnight.—*Conversazione*. A distinguished company will be present and the President and Council earnestly express the hope that members and their guests will make every possible effort to attend what is the most important function of the Society's year. Applications to attend the *Conversazione* may be received from non-members of the Society. Evening dress with orders and decorations will be worn. Ladies are specially invited to be present. During the evening, by kind permission of the Commandant and Officers, R.M., the band of H.M. Royal Marines will play. Tickets 5s. each, including buffet.

One June 17 the Society will be holding a Garden Party at Hanworth. This has been arranged with the primary intention of enabling members of the Society and their guests to meet under pleasant conditions and in enjoyable surroundings. The Hanworth Club is ideally situated for such a garden party. The clubhouse contains all the amenities of a London club, and is situated in the centre of extensive gardens and aerodrome. The whole of the facilities of the Club will be available all day to members and their guests, who will be made temporary members of the Club so that they will have no restrictions in the way of obtaining any extra refreshments they may require. The garden party will begin at 3 o'clock with a Reception by the President and Council, after which an opportunity will be given to members and their guests to fly. From 3.30 to 4.0 the aircraft from which flights will be made will be arranged for inspection in front of the convenient hangar, and during that time the pilots of National Flying Services will make acrobatic flights. Members and their guests will be provided with badges divided into two parts, one entitling them to membership of Hanworth Club for the day and tea, and the other to a flight (weather and circumstances permitting). The second half of the badge must be exchanged for a flight voucher by those wishing to have a flight. They will not be transferable, and must bear the name of the guest or member. During the afternoon a dance band will play, and the band will remain after dinner for the benefit of those who wish to stay. Those who wish to lunch or to have dinner at the Club must notify their intention to do so either at the time of the application for their tickets or direct to the Secretary of Hanworth Club before noon on Friday, June 17, so that accommodation may be reserved. It will not be possible to guarantee either meal without such notification. Lunch will be served from 12.30 to 2.30 p.m., and dinner from 7.15 p.m. to 8.30 p.m. Ladies are specially invited by the President and Council to be present at the Society's garden party. Tickets 5s. each, including tea and a flight.

National Aviation Day Displays

NATIONAL AVIATION Day Displays by Sir Alan Cobham and his "circuit" will be given as follows:—May 20, Biggin Hill, Biggin Hill Aerodrome; May 21 and 22, Maidstone, West Malling Aerodrome; May 23, Canterbury, Bokerbourne Aerodrome; May 24, Dover, Dover Aerodrome; May 25, Chatham, Star Farm; May 26, Heston, Heston Air Park; May 27, High Wycombe, The Flying Ground, Marlow Hill; May 28 and 29, Birmingham, Northfield Aerodrome; May 30, Hereford, Oldfield, King's Acre; May 31, Llandrindod Wells, The Racecourse.

Memorial to Lt. Col. V. C. Richmond

A JACOBAN oak chancel screen in memory of Lt. Col. Vincent C. Richmond, the designer of the ill-fated airship R.101, was unveiled at All Saints' Church, Higham's Park, on May 5.

Glider Pilot Killed

ALAN W. GRAHAM, a member of the Preston and District Gliding Club, was killed as the result of an accident during a towed glider flight at Middleton Sands, near Morecambe, on May 15.

IMPORTS AND EXPORTS

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).

For 1910 and 1911 figures see FLIGHT for January 25, 1912.

For 1912 and 1913, see FLIGHT for January 17, 1914.

For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1930 being given in FLIGHT, January 16, 1931.

	Imports.		Exports.		Re-exports.	
	1931.	1932.	1931.	1932.	1931.	1932.
Jan. ...	7,965	2,456	142,596	122,942	1,074	863
Feb. ...	3,303	2,503	110,587	181,482	1,293	90
Mar. ...	5,615	1,946	83,088	167,195	3,441	200
April	2,216	622	213,401	142,145	530	1,128
	19,099	7,527	549,672	613,764	6,338	2,281

£ £ £ £ £ £

PUBLICATIONS RECEIVED

U.S. National Advisory Committee for Aeronautics Reports: No. 405. *Application of Practical Hydrodynamics to Airship Design*. By R. H. Upson and W. A. Klikoff. Price 15 cents. No. 406. *Drop and Flight Tests on NY-2 Landing Gears including Measurements of Vertical Velocities at Landing*. By W. C. Peck and A. P. Beard. Price 15 cents. No. 407. *The Characteristics of a Clark Y Wing Model Equipped with Several Forms of Low-Drag Fixed Slots*. By F. E. Weick and C. J. Wenzinger. Price 10 cents. No. 409. *The Elimination of Fire Hazard due to Back Fires*. By T. Theodorsen and I. M. Freeman. Price 10 cents. No. 410. *The Theory of Wind-Tunnel Wall Interference*. By T. Theodorsen. Price 10 cents. No. 412. *The 7 by 10 Foot Wind Tunnel of the National Advisory Committee for Aeronautics*. By T. A. Harris. Price 10 cents. No. 413. *A Method for Computing Leading-Edge Loads*. By R. V. Rhode and H. A. Pearson. Price 10 cents. Superintendent of Documents, Washington, D.C., U.S.A.

Technical Notes of the National Advisory Committee for Aeronautics: No. 406. *The Use of Large Valve Overlap in Scavenging a Supercharged Spark-Ignition Engine Using Fuel Injection*. By O. W. Schey and A. W. Young. April, 1932. No. 409. *Effect of Ageing on Taut Rubber Diaphragms*. By D. H. Strother and H. B. Henrickson. Feb., 1932. No. 410. *Experiments on the Distribution of Fuel in Fuel Sprays*. By D. W. Lee. March, 1932. No. 411. *Rapid Chemical Test for the Identification of Chromium-Molybdenum Steel Aircraft Tubing*. By J. C. Redmond. March, 1932. No. 412. *The Aerodynamic Characteristics of Airfoils at Negative Angles of Attack*. By R. F. Anderson. March, 1932. No. 413. *The Compressive Strength of Duralumin Columns of Equal Angle Section*. By E. E. Lundquist. March, 1932. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

£ £ £ £ £ £

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors. (The numbers in brackets are those under which the Specification will be printed and abridged, etc.).

APPLIED FOR IN 1931

Published May 19, 1932

- 1,030. G. SOUCEK. Luminous signalling-device for night landing. (371,383.)
 2,290. F. H. PAGE and H. PAGE, LTD. Means for controlling aeroplanes. (371,442.)
 2,719. F. J. HALL. Anti-dazzle and fog-piercing screen for fitting to aircraft landing-lights. (371,467.)
 2,746. E. GRIMM. Toy parachutes. (371,470.)
 3,551. SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT, LTD., and H. N. WYLIE. Airscrews. (371,499.)
 5,682. M. DE BERNARDI. Combined controlling device for steering and stabilizing aircraft. (371,526.)
 14,092. J. SILVERMAN. Landing-gear. (371,629.)
 14,847. E. E. DOVE. Devices for securing bonnets of automobiles, aircraft, etc. (371,636.)
 18,995. D. NAPIER AND SON, LTD., and R. W. VIGERS. Liquid-fuel injection pumps for i.c. engines. (371,685.)
 19,233. P. DUGELAY and SEBIA (Soc. d'Exploitation de Brevets pour l'Industrie, l'Aviation et l'Automobile). Valve mechanism for high-speed compressors. (371,688.)
 19,566. N. J. MEDVEDEFF. Flying machines. (371,691.)
 21,409. CURTISS AEROPLANE AND MOTOR CO., INC. Cowling-rings. (371,710.)

FLIGHT, The Aircraft Engineer and Airships.

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